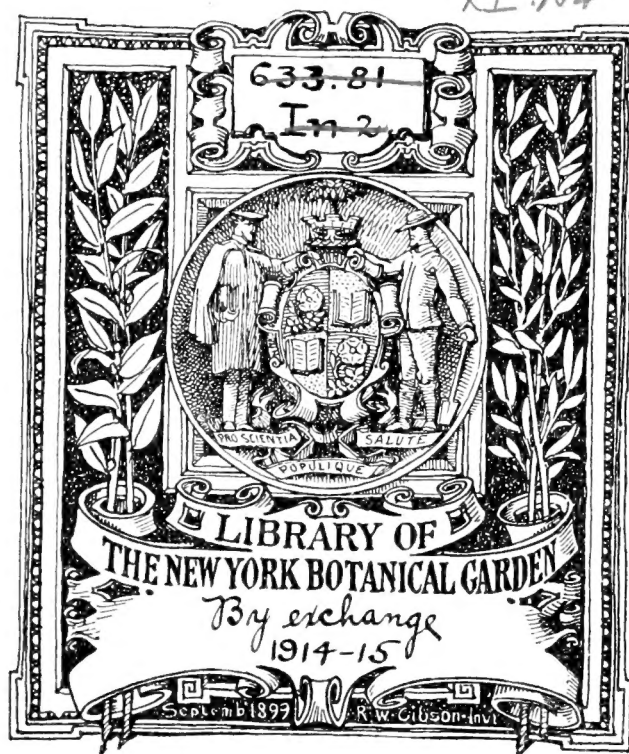
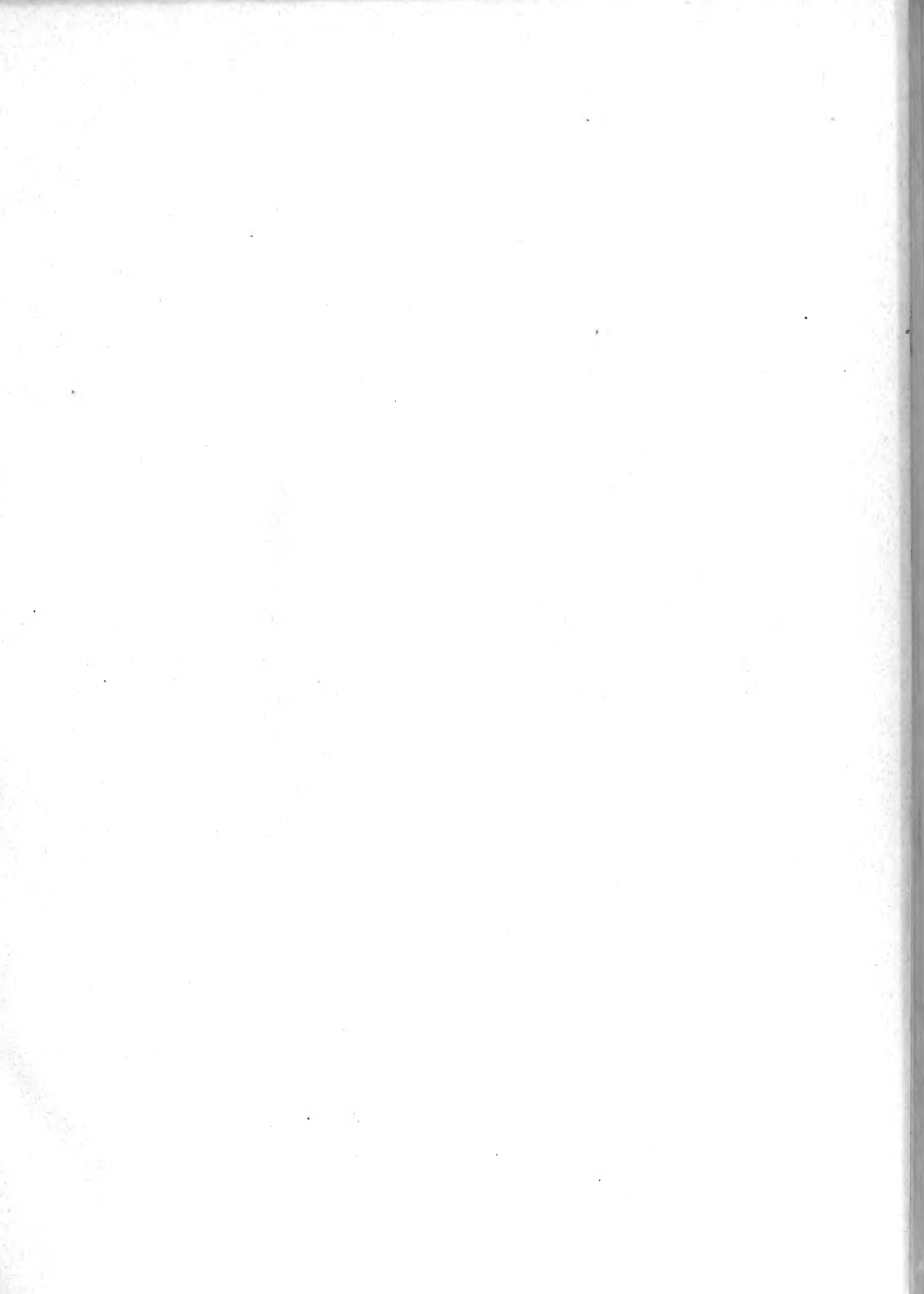


XI. N4





The India Rubber World Index

VOLUME LI

October 1914, to March, 1915

VOLUME LII

April 1915, to September, 1915

NEW YORK:

THE INDIA RUBBER PUBLISHING CO.
1915.

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Edited by HENRY C. PEARSON—Offices, No. 25 West 45th Street, NEW YORK.

Vol. LI. No. 1.

OCTOBER 1, 1914.

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Published on the 1st of each Month by

THE INDIA RUBBER PUBLISHING CO.

No. 25 West 45th Street, New York.

CABLE ADDRESS: IRWORLD, NEW YORK.

HENRY C. PEARSON, Editor

Vol. 51.

OCTOBER 1, 1914.

No. 1

SUBSCRIPTIONS: \$3.00 per year, \$1.75 for six months, postpaid, for the United States and dependencies and Mexico. To the Dominion of Canada and all other countries, \$3.50 (or equivalent funds) per year, postpaid.

ADVERTISING: Rates will be made known on application.

REMITTANCES: Should always be made by bank draft or Postoffice or Express money order on New York, payable to THE INDIA RUBBER PUBLISHING COMPANY. Remittances for foreign subscriptions should be sent by International Postal Order, payable as above.

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Entered at the New York postoffice as mail matter of the second class.

TABLE OF CONTENTS ON LAST PAGE OF READING.**THE FLOOD-TIDE OF OPPORTUNITY.**

SOMETIMES it happens that reasons, astronomical and meteorological, are combined to bring upon a coast a high tide, the memory of which lives in history, legend and song. Whether it brings disaster or opportunity, the high-tide of a lifetime or of centuries brings the time for action. This year of 1914 brings to American exporters a high tide of opportunity such as they have not known before and will not know again. They have had seven years of practically unchecked prosperity.

The old threats of unsettling the monetary standard are as dead as that of danger from the French and Indians. We have a financial law satisfactory alike to conservative bankers and to merchants anxious for expanded credits—a law which, in the opinion of most financiers, makes forever impossible the recurrence of the old-time panics. The Panama Canal has been opened, giving easy access to new markets and giving the American a position of vantage at the meeting place of the commerce of the world. The tariff law recently enacted opens our markets to return cargoes from the countries of the south—wool, meats, lumber and sugar being added to the free list, which already held the great staples of coffee,

rubber and cocoa. Steps have already been taken under the new banking act to establish American branch banks in the most important cities of South America and such banks are certain to be multiplied, having close relations with the existing South American banks.

With this flood of opportunity comes the tremendous fact of the great European war, which in a moment absolutely annihilates the export trade of the country holding second place among the trading nations of the world. Until peace is declared, or there is accomplished the improbable event of Germany obtaining control of the sea, the great export trade of that country lies open to pre-emption on the part of whoever is sufficiently alert and enterprising for the task. The British are going after this trade with all the energy they may summon, but they have the distraction of a war which has threatened their national life and a war expenditure of not less than three million dollars a day, and they have plenty to do in looking after the trade which they already possess.

The old complaint of lack of direct lines is in a fair way to be obviated. Americans may now go into the markets of the world and buy ships as they may buy other things necessary to commerce and industry. Our country, during the next twelve months, will have more money free for the best-paying enterprise than all the rest of the world combined. Nothing stands in the way of a vast extension of American trade, except the failure of the manufacturers to take full advantage of their opportunity.

If they look for "easy money" by marking up domestic prices and say, "Who cares for abroad?" they will get their answer soon enough. They will enjoy their ease for a year or two and then find themselves hard pressed in their own markets by the competitors they have allowed to distance them in the trade which might have been theirs. They must go after the Spanish-American trade with promptitude and vigor. They must make immediate and intelligent effort to find what classes of goods are wanted in the various countries and send agents who speak Spanish and who understand the business and social customs of the people whose trade they are to solicit—not demand. They must get out attractive and intelligible catalogs in the language of the country to which they are going. They must take pains to fill the little orders with exactly the goods the customer desires. They must obey shipping directions implicitly and to the last letter. If they fail in this regard, they lose all that effort has gained. They must give as good credit as their customer has hitherto received from Euro-

pean houses. The new banking law will enable them to get the money necessary for this feature, if they should need it. For reasons not necessary to be described, the feeling toward us in Spanish-America is better than for a long time past. If the American manufacturers go into this magnificent market with the proper spirit—and manners—their children and their children's children will enjoy the profits of that trade.

THE WAR AND THE ENGLISH RUBBER TRADE

WHAT effect the war has had upon the rubber trade in Germany can only be surmised, as the channels of communication between that country and the outside world are to a great extent closed, but it can safely be conjectured that, outside of those lines that would contribute to the efficiency of Germany's military and naval operations, the rubber trade of that Empire is in a state of at least temporary paralysis. The effect of the war on the rubber trade in England is described in considerable detail in the letter which appears in this issue from our regular English correspondent. He states, as would naturally be assumed, that the companies engaged in the manufacture of rubber flooring for tents, motor tires for transport wagons and ambulances, rubber sheeting, elastic bandages for hospital use and other articles used by the army and by the Admiralty are running on government orders that keep them at full capacity during the entire twenty-four hours, but other companies whose products are intended for use in peaceful vocations are generally operating only on part time. This is due, to a certain extent, to the large number of men who have been withdrawn from work in the factory to go with the forces in the field—in one case a thousand employees having left a company for military service—but even to a greater extent this idleness is due to the decreased demand for merchandise generally.

The English manufacturers appear to have all the rubber that is needed under the present conditions of the trade, and with the exception of one chemical—zinc oxide—the English supply of which has come largely from Liege in Belgium, the supply of compounding ingredients promises to be ample. But the present situation in England is another illustration of the fact that while war excites certain lines of industry—those that contribute to military equipment to feverish activity, the effect upon all other lines is deadening and in time disastrous.

MR. COWEN AND THE MARKS PROCESS.

IN the very interesting lecture delivered by Mr. L. J. Plumb before an English commercial school in England recently, the speaker said, speaking of the Marks alkali process: "It is probable that he received his first knowledge as to the effect of caustic soda on rubber from his superior, Mr. Robert Cowen. As early as 1890 Mr. Cowen in private conversations had discussed the possibilities of using caustic soda for reclaiming, and there is no question but he made a number of experiments along these lines."

It happens that the editor of THE INDIA RUBBER WORLD was a close friend of Robert Cowen and, living in Boston, was a very frequent visitor at the factory of the Boston Woven Hose & Rubber Co. When the little laboratory was first installed and the young men from the Massachusetts Institute of Technology brought in, he met them all and their work was thoroughly gone into. Mr. Cowen was a fine machinist and an inventor, but he was not a chemist. As the writer remembers it, he was wholly in favor of the acid process for reclaiming. When Mr. Marks succeeded with his alkali process and went on record as to its great future value, it was put down as a bit of youthful enthusiasm not to be taken seriously. When Mr. Marks resigned to join the staff at the laboratory of the Revere Rubber Co. his alkali process was not even considered. It was not until he had made a success of it that others were said to have suggested it, to have experimented along the same lines or to have anticipated him. Were Robert Cowen alive today he would in his frank way give Mr. Marks full credit for his process.

A WAR TAX ALTHOUGH NO WAR.

NOTWITHSTANDING the Government's determination to maintain strict neutrality during the present disturbed conditions in Europe, it cannot altogether escape the effect of those unhappy conditions. Customs receipts have fallen off to such an extent that the Administration has been compelled to cast about for sufficient revenue for the efficient operation of government functions. The measure before the Senate Finance Committee—known as the War Tax Revenue Bill—which is designed to raise a yearly revenue of about a hundred million dollars, lays a particular burden upon the brewer, wine grower, tobacco producer and purveyor of amusement. On the rubber manufacturer as such no special

burden is laid, but indirectly he, with all others actively engaged in the transaction of business, will have to pay a stamp tax on various documents for instance, promissory notes, insurance policies, deeds and mortgages.

It is the contention of the minority party that the Administration might better economize in sundry directions than to increase tax rates, but economy is a virtue more generally preached by the opposition party than practised by the party in control. The subject of taxation is one that has received the best attention of the economists for generations but there is one variety of tax that none of them has yet appeared to be able to devise—a popular tax.

NORTH AMERICAN BANKS IN SOUTH AMERICA.

MENTION was made in the August issue of this publication of the purpose of the National City Bank of New York to establish branch organizations in Rio de Janeiro, Buenos Aires and probably other cities in the republics to the south.

American banks are greatly needed in South America. The European banking houses established there have hitherto accommodated the ordinary routine of American trade, but they have naturally withheld the full measure of interest and solicitous support accorded to enterprises of their own nationality. The English and German bankers have transacted the larger part of the business pertaining to foreign commerce and have steadily extended a network of branch banking institutions and exerted their influence to the advantage of European trade. European banks not only finance trade between their own countries and South America, but also between the various Latin-American nations. They supply their home offices with ratings and characteristics of South American firms and individuals. The German trade was extended largely by aid of longer credits than are granted by other countries, and German banks have been made more minute in their service and organization.

BRITISH WAR ON GERMAN TRADE.

BRITISH merchants and manufacturers have followed their government in declaring war on everything German. For the time being, Germany, as a competitor in foreign trade, is down and out. Except for an insignificant amount of trade going to Holland, Switzerland and Scandinavia, German exports can go only as far as her armies may march. In a few months, or years, peace will be declared and Germany will go out among the na-

tions of the earth to pick up the trade she has dropped. Will she find it? The English are determined that she shall not. Newspaper organizations and private workers are calling with all their energy upon the British business men to deal a blow to the foe by going after the trade of Germany and Austria in every quarter of the globe. It is urged both as a patriotic duty and as sound business policy. It is held, looking from their own standpoint, of course, that they are engaged in a righteous war and that a blow which weakens the enemy is one which should be delivered if possible; that the great losses brought to them by the war they may honorably recoup in this way; that a realizing sense of the trade going to irrevocable loss will move the enemy to a desire for early peace, and that, finally, the British want all the trade they can get.

With characteristic British thoroughness, the campaign is being organized and forces mobilized for the attack. The Board of Trade has made special arrangements for an exhibition of samples of goods of German and Austrian make. Statistics of the trade of the hostile countries are furnished to the manufacturers, who thus can see the magnitude and location of each market and exactly what goods have been going there. Short of having the orders rounded up for them it is hard to imagine what further the manufacturers could ask. At the same time they are being warned that they have more to do than merely to pick up derelict trade. The Germans have been very thorough in their methods. The offer of unsatisfactory substitutes would be only a stop-gap performance, holding the customer for the German manufacturer until the latter was able to supply the customer's wants.

A heavy blow has been dealt to hostile foreign competitors by canceling, under certain conditions, "blocking" patents held by subjects of Austria and Germany. This was at first reported in such a form as to create a misapprehension. It is not intended to interfere with any patent under which active manufacture of the patented article is going on in Great Britain, but only with those which under British laws forbid the manufacture of an article which is made in Germany. Upon the payment of a fee of two pounds, any British subject can obtain permission to manufacture any article covered by one of these "blocking" patents. The applicant must also show his "bona fides" that he actually intends to carry out in good faith the manufacture which the patent has hitherto blocked. In the matter of drugs and chemicals this is likely to have an important effect, many articles essential to present-day arts being held as a close monop-

oly by German firms and sold at prices enormously in excess of cost and ordinary profit.

Manufacturers are just now inclined to hold back for assurances that if they put large capital into a new enterprise this capital will not be rendered valueless by an early peace and a restoration of the blocking patent. It is likely that these assurances will be given. In the meantime, the vast and well-oiled machinery of the British Consular Service will be working in every quarter of the globe in a way which can scarcely fail to be of as great damage to the German material interest as that being waged by the armed hosts now on the battle fields of Europe.

SHIPPING LATEX TO LONDON.

REPORTS which apparently emanate from London have recently come across the water to the effect that a group of English capitalists, having secured from an inventor a secret process for treating latex, intend to ship it direct from the plantations to England and convert it into rubber by this new process. All of which is interesting, but hardly likely to occur.

In the first place, the shipping of latex to London, New York and other points quite distant from the place of gathering is no novelty. To be sure it never has been shipped in large quantities, for there has been no reason to make such shipments, but wherever any quantity of latex has been desired for purposes of experiment or exhibition it has been found possible to ship it without having its qualities noticeably affected during transportation. And in the second place, there would be no advantage in shipping latex in bulk to a considerable distance from the plantation, for any process capable of converting latex into rubber in London would be capable of bringing about the same result on the plantation or in the forest.

GERMANY'S VAST MANUFACTURES.

THE stupendous German manufacturing trade which on the day that Emperor William handed his passports to the British Ambassador passed into the things that were, has a more than academic interest to a country like ours, which ranks fourth in manufactured exports among the nations of the world. Some day, we may be sure, Germany will again be one of the great exporting countries. But at the present time she may be considered as completely eliminated from the field of international commerce. Speaking in round

figures, the exports of manufactured goods recently amounted to about two thousand million dollars a year for Great Britain, fifteen hundred million for Germany and seven hundred million for the United States—the exports of the latter being largely of a sort in which cost of raw material is the chief factor and not the “added value,” which makes export trade profitable to the exporting nations. France has hitherto exported rather more manufactures than the United States, while Austria lags behind with less than half as much, or about \$250,000,000. This is quite a tidy bit of trade, however, and it is prostrate along with that of Germany. A feature of great interest is the fact that fully ten per cent. of the great German export trade found a market in the British Empire. This trade is not readily going to Germany after the close of the war. In the British Colonies, in Spanish America and in the Far East there are rich markets waiting for somebody—markets which Germany supplied but can do so no more.

These statistics of German rubber manufacture are of special interest to readers of this magazine.

AT ANY RATE IT IS FINE FOR GUAYULE.

THE mighty conflict in Europe has put the Mexican situation very much in the background, but the turbulent little republic still goes on its merry revolutionary way. But in all this gratuitous—one might almost say grotesque—loss of life and property, the humble guayule shrub is deriving a distinct benefit, for it is getting a much needed rest. Three years ago, when the factories were busily extracting its rubber content, it appeared to be approaching a condition of practical extinction, but since the overthrow of the Madero regime the guayule shrub is about the only thing in Mexico that has been left undisturbed! It needed the rest badly and has used it to great advantage. When the Mexicans get tired out with shooting one another, as they will some day, and settle down for a brief period of tranquility, guayule should once more be an interesting feature of the rubber market.

THERE ARE FOUR LINES OF RUBBER MANUFACTURES in which the Germans took the lead: Rubber Toys, Hard Rubber, Ocean Cables and Asbestos and Rubber Packings. With their export impossible and the factories idle, the opportunity for American and English rubber manufacturers is obvious.

TIRES ARE CONTRABAND BECAUSE THEY ARE A PART of military equipment. Why not because they are explosives?

What I Saw of the War.

By the Editor of THE INDIA RUBBER WORLD.

MORE than a year ago I promised to attend the Rubber Congress to be held in Java in September, 1914. It seemed more than likely that from that gathering would come an immense amount of good to the whole rubber planting world. It was up to the scholarly Dutch to solve the final problems and show the way to cheaper and better plantation rubber. That was expecting a great deal, but their record in cinchona and other tropical products justified such belief.

To do my part I had, first, a hundred lantern slides to show the planters just how rubber was manipulated when it got to the factory; second, an essay showing what manufacturers desired in crude rubber, and, having acquired the cup habit, I had presented a cup. Moreover, although the committee had offered to give me a generous sum for expenses I had refused it. Hence, optimistic, sure of a welcome, positive that the congress would be great in results, I made ready to go by the shortest route. That was by an Italian line to Genoa, Italy, and thence by a Dutch boat to Batavia. Premonitions of evil I had none. Prophetic hints were of no effect. For example, Edgar Beecher Bronson, the war correspondent, the night before my departure said: "Sure you are not going into *Closed Territory*?" I assured him that big game hunting or war would not come within my ken. Nor when Dr. Hornaday, sending me his book on the birds of Java, wrote on the fly leaf a happy phrase about my going to the "firing line" did it stir me.

ON THE DUCA D' AOSTA.

The embarkation was without tremor. Finding the one steward who would talk a little English and good Spanish we settled down to enjoy the trip. By a bit of good luck we became friendly with one of the wireless operators. He spoke English slowly, but wrote it exceedingly well, and was good enough to post the news in English for the benefit of the six English-speaking passengers. Five days out we learned that Austria and Serbia were at war. There came reports of what Germany, Russia, France and England said they would do, if either of the others did certain things. Then the occupation of Belgium and the big war was on.

*Mr. Bronson's book "In Closed Territory" is a personal narrative of big game hunting in East Africa.

In spite of the excitement we played deck and ate three meals a day and enjoyed ourselves.

Passing Gibraltar at three in the morning a half dozen British war ships slid by and out to sea. Two days later out of the morning haze came a cruiser head on at full speed as if she meant to cut us in two. We stopped and signal flags bobbed up and down, and the wireless, frantically chattering, told the story of who and what we were. We satisfied the investigator, and in a curve that rolled up a huge wave she steered off. Then as it grew lighter we saw that she was a scout for the French fleet, some fourteen vessels of which we could make out in the distance.

Our first call was at Naples, where the American Consul was discovered up to his eyes in work issuing passports and quieting hysterical women travelers. He had little news and no cables. The next day we reached Genoa, and gladly paid a bandit five lire (a dollar) to take our luggage off the ship and deliver it to a brigand who for another five lire took it into the custom house, where a freebooter put it on the baggage wagon for ten lire. We reached the hotel without further depletion of our store of ready money.

The next day things moved rapidly. First to the Dutch line, where a cable from Java announced that the Congress was postponed; then to the American consulate which was crowded with other Americans; and all we could learn was that we must report there every day. No bulletins, no news, no newspapers! Then to the bank to find that letters of credit were not honored.

My host at the "Miramara" was a Swiss and, luckily, a fellow townsman of the late Dr. Jacques Huber, of the Musee Goeldi at Para. The mention of Dr. Huber's name worked wonders. My American money was taken or exchanged at full value. The assurance was given that we could have what we wished and pay whenever letters of credit were good again. Nevertheless I made the daily rounds of the banks, and finally things loosened up a bit; one gave five pounds, another four and one twenty. My request was always for fifty

But Italy was mobilizing and war seemed imminent; so we decided to go either to England, Spain or Portugal. To the British consul we went, and he told us of the "Cretic" sailing the next day. A few quick trips to the American consul



THE EDITOR OF THE INDIA RUBBER WORLD
"ON WATCH."



RESTING ON THEIR WAY HOME.

papers showing citizenship, to Cook's office for drafts for passage against my letter of credit, to the White Star office to exchange the drafts for tickets, and we were steerage passengers bound for England.

After a last visit to the cable office that accepted money for cables that never were sent, we went aboard the boat, first buying steamer chairs, and prepared to make ourselves comfortable. It was easy to see that the boat was overcrowded, ergo so would the dining saloon be. Five dollars to the head steward placed us in the "first sitting." That meant breakfast at eight, instead of nine or ten. Then we hunted a good place for our chairs—one cool but not cold, and not likely to be swept by rain. Then we looked the baths over, and a very little figuring showed that many would perforce go bathless. Then we faced the steerage. We were located in Compartimento 2, Cuccetta N. 5 and 6. It took some time to find it, but by getting the stairways located, and guided by the galley smells first and the bilge odor second, it became in time quite easy. It was bad, but not so awful bad—better at least than many of the Central American boats, for there were no pigs, dogs, crying babies or seasick women. There were several fleas, and one could find bed bugs, and that in spite of the formaldehyde odor that spoke of recent fumigation. Naturally the steerage was in the bowels or rather the intestines of the ship. Our "compartimento" was a big room, filled with racks made of gas pipe, double tiered, on which lay narrow burlap mattresses filled with hay. On each was a red wooden blanket and a single white sheet—clean, too. The ports were open and the air was warm, but sweet. We did not sleep there, preferring to take mattresses and blankets up four flights of slippery stairs and camp

under the stars. As cabin passengers and all felt the same way, the decks were fairly well cumbered, and a wonderful variety of pajamas and bath robes was displayed.

There were only eighty Americans, and the six hundred Britons took the whole affair as a matter of course, so there

was no guying and little horse play, and soon the whole proceeding became as matter of fact as if it had been a life-long custom. There was one break in the solemnity. A huge man, said to be a distinguished scientist, elected to bed down on a hatch, where the smoking-room lights were brightest. He wore a thin cotton night-shirt only, and as he stood up to make his bed his anatomical idiosyncrasies were plainly displayed. An occasional wet sponge thrown by a compatriot, and the sewing up of the night-shirt in no way dis-

composed him, and he continued his shadowgraphs to the end of the voyage.

Most of the regular crew had gone to the wars and the raff that were shipped in Genoa were very able and persistent thieves. They went through the steerages and looted trunks

and stole suitcases, until one hundred of us were made special police. We stood two-hour watches, day and night, and thus put an end to their thieving. Stewards were few and overworked (so were bath towels), and passengers turned to and wiped dishes. Indeed, the American ladies, too, both wiped and swiped, for guests though we were the souvenir instinct was too strong to be resisted, and

after-dinner coffee cups and spoons disappeared like magic. This, too, in spite of the fact that the bulletin board in the main saloon bore these verses:

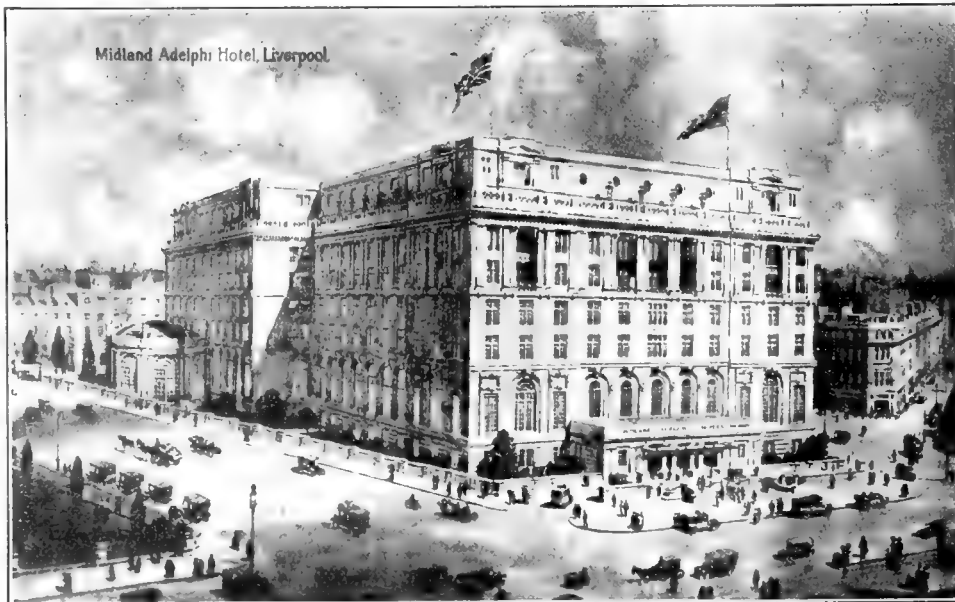
Moses, lawgiver for all time,
Wrote for the sons of men



"PRINCE UDINE"—FIRST SHIP TO LEAVE GENOA WITH STRANDED AMERICANS



THE "CRETIC"—THE FIRST SHIP TO LEAVE GENOA WITH BRITISH REFUGEES.



THE MIDLAND ADELPHI HOTEL, LIVERPOOL.

the Midland Adelphi Hotel, Liverpool.

A model code of moral laws.
The old Commandments, ten.
"Thou shalt not steal" seemed plain enough.
To this clear-minded seer;
Today we feel he should have said
"Thou shalt not souvenir."

We were sailing under "sealed orders" for England, but whether London, Southampton, Liverpool, or other port, none knew. Reaching Gibraltar, Liverpool was announced as the destination. Thereafter we stole along through the night, ports shrouded, deck lights out, and blankets hanging on the smoking-room windows. About noon each day a battle-ship appeared and telegraphed the course for the next twenty-four hours. No news, or next to none, was received, as the wireless was used only for admiralty purposes.

Among the British passengers were many whom I knew—rubber planters from the Malay States, a young Englishman connected with the Booth office in Para, the superintendent of public works in Barbados, and so on. A Boston Minot, one of the editors of the "Youths' Companion," organized the Free Masons aboard, some sixty in number, one-half of whom were English and the rest Americans, and a sort of informal lodge meeting was held daily, where we all became well acquainted.

By Spain and Portugal we ran and finally reached the mouth of the Mersey. Presumably it was defended by mines, for we

equally congested. Finally, at two in the morning, beds were found in a boarding house, and we slept the sleep of the "bust."

It looked as if real hardships were in sight, but the next morning I met by accident a rubber friend, who hurried to the Adelphi Hotel, one of the best in Europe, secured the rooms of some Americans who were leaving that day, brought around fifty pounds in English money, and did his best to make us comfortable. The next day, by special favor, the banks allowed me to draw all I needed on my letter of credit.

A brief look at English business convinced me that there was little doing in any line, so passage home was negotiated. So

crowded were the outgoing boats that Deck "D" on the old "Campania" was the best in sight, and I received it thankfully.

I was not the only rubber man caught by the war. I heard of numbers of them, and found that F. C. Hood was also quartered at the "Adelphi." He had been caught in Berlin, and with his wife and son journeyed to Norway, there taking ship to a port in Scotland. The Hoods also slept on deck, and arriving at the Scottish port were forbidden to land—army orders. Mr. Hood managed to get ashore, saw the chief of police, and arranged that in the event of the boat leaving that evening for Norway, they be arrested and taken to the police station for examination. This ingenious plan, however, was not necessary, for at the last moment the rule was waived and they came ashore.

With some time on my hands, I visited rubber stores, general stores, talked with manufacturers and filled up on information.

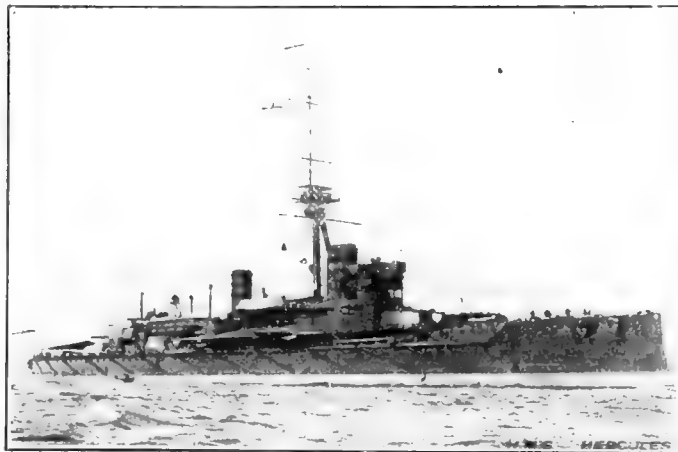


READING THE WAR NEWS—A COMMON SIGHT IN ENGLAND.



SOLDIERS DRILLING ON THE GOLF COURSE, ENGLAND.

were guided by wig-wags, on boats stationed at intervals, and we zig-zagged slowly along, and at seven in the evening made fast to the pier. A wait of two hours ensued for the discharge of the luggage. Once ashore, instead of the usual orderly British custom house, we found a mob of frantic passengers, harassed officials and incompetent porters. The war had taken baggage trucks and men, and upset all system. At eleven o'clock our baggage was cleared, loaded on taxis, and hotel hunting began. All of the large hotels were choked with Americans—so full that it was hard work to get anything to eat. The little commercial hotels, the temperance hotels, and the pensions were



VESSELS OF THIS SORT ARE MORE OFTEN SEEN THAN MERCHANTMEN.

Again and again the question was asked: "Where in America can I get this?" "What rubber manufacturers make that?" And I gave addresses by the score. The interest seemed chiefly to center about small specialties in hard rubber and grades of

garden hose, stoppers, etc., that had been aforetime purchased in Germany. Finally we embarked, and except for the bad air down on deck "D," were comfortable. As for dangers, there were none apparent, in spite of shrouded lights and top speed.

The tales of war experiences on the part of other travelers are many, and have been told and retold in the daily press.



THE CAMPANIA CROWDED WITH AMERICANS.

One thing was patent, however, and biased the judgment of all the { English } were mighty good to Americans and the re- { German } { French } cipients of courtesies believed that they would win.

SOME LIGHTS ON THE WAR.

THE editor of THE INDIA RUBBER WORLD talked with many in the trade during his recent stay in England. Some of the views are embodied in the following paragraphs:

The head of an English firm who sold supplies to rubber companies on the Continent, said:

"Two months ago I had an income of £30,000 a year. Today I am out of business. My factories are shut down and I cannot pay my clerks. Thousands and thousands of pounds owed me on the Continent are absolutely lost until the war is over, and no assurance of ability to pay even then.

"If I were young enough I should enlist to fight the Germans, or, rather, the German military idea. I know that at heart my many friends among the German manufacturers are not my country's enemies. This war was not of their seeking. It is a terrible setback for the rubber industry."

Another said: "I am running day and night shifts getting out truck and ambulance tires. Most of the good motor buses and motor trucks in England, as well as many motor cars, have been commandeered by the government. They took over all the stocks of tires that were in sight, English, French, German and American, but that was not half enough. So we are striving to make up the deficiency."

Still another said: "My best men have enlisted, but as orders are slack we get along running about half time. Hope the war is a short one; else we shall lose heavily."

Still another said: "We are busy, but are nevertheless helping our men to enlist. Numbers of us belong to a Trade Association, and we guarantee the following to men who are eligible for the army or navy:

"(1) A minimum of four weeks' full wages from the date of leaving; (2) re-engagement on return guaranteed; (3) half-pay during absence from duty for married men from date when full pay ceases; (4) special arrangements with single men who have relatives entirely dependent upon them; (5) after war, all Territorials to be given three weeks' holiday, provided that two weeks are spent in camp. The response has been quick and satisfactory, and already several hundreds have expressed their intention of enlisting, and the numbers are rapidly growing."

A young aviator who was for some time a rubber worker sent home the following from France, as an accurate summing up of the relative efficiency of French and German types of dirigibles:

"French airships have been doing excellent work, and have so far escaped unscathed, although often under fire. One of them, starting from Maubeuge, flew over Treves and beyond, returning safely to its shed. On the other hand, we have bagged several Zeppelins.

"The reason for this apparent invulnerability of the French airships is simple. By reason of the elasticity of our gasbags we can safely maintain a very high altitude, beyond ordinary gun range. This is impossible with the rigid shell of the Zeppelin, which cannot bear the expansion of gas, more particularly in this hot weather; so the French have a distinct advantage in airships."

The cancellation of German patents was thought a good move by most, but one cable manufacturer said:

"We own the British rights for an important German patent. Now I wonder if that will be cancelled. And if it is, what can we do about it? We paid thousands of pounds for it. I fancy there will be many such cases."

Regarding the cargoes of seized ships the Foreign Office publishes in the "Supplementary London Gazette" as full a list as may be. The Government is also soon to publish a list of those detained in Belgian, French and Japanese ports. Seized ships are brought before the regular prize courts, and those interested in the cargoes are represented by attorneys at these courts. If the goods are not contraband they are speedily released.

A British manufacturer wrote to the "London Times" this regarding the great Siemens Cable Works:

"According to Somerset House, the great and old-established firm of Siemens Brothers (Limited), of Woolwich, has a paid-up capital of £600,000 in 120,000 £5 shares, and of these 120,000 shares no fewer than 70,782 are held by members of the Von Siemens family in Berlin, the address being 'Verwaltungsgebäude Siemensstadt bei Berlin' (Administration Building, Siemenstown, near Berlin.). That is to say, Messrs. Siemens Brothers (Limited), of Woolwich, are absolutely controlled by the immense Siemens and Halske concern in Berlin. Out of 49,000 odd shares held in this country, about 39,000 belong to two gentlemen whose affiliations are certainly German. The 70,000 odd shares held in Berlin probably represent a steady drain of somewhere about £35,000 a year from this country to Germany from one firm alone, and without a solitary countervailing advantage.

"That is a sufficiently serious matter, but the interesting point to which I think public attention should be drawn is that it is stated in technical circles in London (with what truth I know not) that the British Government has given large orders for war material to Messrs. Siemens Brothers because the Government cannot help itself. It must have the war material, and the big British firms are working night and day on Government orders and can do no more. In other words, a considerable portion of the profits from British orders for war material to fight Germany will go to Germany to help Germany to fight us."

In the same issue appeared a list of other German-owned firms, among which were: The Continental Tyre and Rubber Co. (Great Britain), Limited, with a capital of £25,000, £24,000 of which is held in Germany;

The British Ceresit Waterproofing Co., Limited, capital £5,000, £4,950 held in Germany;

Calmon Asbestos and Rubber Works, Limited, £30,000, all held in Germany;

Armaduct Manufacturing Co., Limited, capital £6,651, £5,252 held in Germany.

Regarding debit and credit accounts between belligerents the managing director of Nicholson's Raincoat Co., Limited, offers the following:

"According to figures extracted from Whitaker, the imports from Germany to this country for the year 1913 were £70,000,000, and our exports to Germany £59,500,000; therefore we may assume that we are debtors to Germany on balance by about £10,500,000.

"Further, if we allow an average of two months for settlement of accounts, it would appear that one-sixth of the annual turnover of £130,000,000 is constantly owing. Therefore there is in suspension at the present time probably £21,000,000 debtor and creditor between Great Britain and Germany alone. By the proposed scheme this sum could be quickly liberated, to the immense benefit of commerce and industry in our own country.

"In the case of my firm, we are creditors to a considerable amount and if we could receive this sum from firms who are debtors, through the medium of a clearing-house, it would enable

us to provide further occupation for our 500 workpeople and thus help the nation generally."

In spite of the appeal on the part of American users, England has definitely stopped the export of aniline oil.

Prof. Atwood, of the American Association of Commerce, Berlin, known to many in the rubber trade, did good work in helping stranded Americans during the first of the war panic.

Some one played a mean trick on an Akron youth, employed in a British rubber factory. As he was about to start off on a vacation, he was ordered to appear at police headquarters, where information had been lodged that he was a German, and that he had not registered. In spite of his protestations he was ordered not to go more than five miles from the station, and his vacation trip became impossible.

Ernest E. Buckleton, president of the Northwestern Rubber Co., Limited, is doing a lot for the Red Cross, furnishing yarn for socks, material for bandages, and enthusiastically stirring up volunteer workers to prepare these materials.

The report that Germany had hundreds of tons of synthetic rubber and that domestic factories were using it in lieu of natural rubber and thus suffering no inconvenience is generally discredited in England.

Dr. Joseph Torrey, at Litherland, is editing the papers read at the last London Rubber Exhibition preparatory to issuing them in book form. He is greatly handicapped by the impossibility of securing corrected proofs from authors resident in France, Belgium and Germany.

EUROPEAN RUBBER NOTES UNDER WAR CONDITIONS.

During one of the battles near Muelhausen, Alsace, the villa of George Chatel, director of the Automobile and Aviation Co., of that city, was struck by a shell and Mr. Chatel and his wife both killed.

The Agricultural and Industrial Exhibition which was to have been held in Rovno, Russia, this fall, has of course been postponed. If the conditions warrant it, it will be held from August 28 to September 15, 1915.

The India Rubber, Gutta Percha and Telegraph Works Co., Ltd., of London, will pay half wages to the wives and families of all its employees who enlist in the service, and employment will be found for them on their return.

Owing to the important foreign contingent in Mincing Lane, many of its representatives have been called to arms by one or another of the belligerents. Among them is Mr. Robert Kahn, of Hecht, Levis & Kahn, who has been summoned to the French colors.

It is reported that M. Michelin, of Clermont-Ferrand (France), the tire manufacturer, has established a fund equaling \$200,000 for the benefit of French aviators who may perform acts of exceptional heroism during the war.

REDUCTION IN BRITISH RE-EXPORTS OF RUBBER.

The more immediate effect of the war upon the English rubber market is shown by the re-exports to other countries from England during the month of August of the years 1913 and 1914.

	1913.	1914.
Russia	1,286,200	63,200
Germany	1,602,500	652,500
France	876,200	467,900
United States	4,242,100	2,184,600
Other countries	1,010,600	474,300
Total	9,017,600	3,842,500

Should be on every rubber man's desk—Crude Rubber and Compounding Ingredients; Rubber Country of the Amazon; Rubber Trade Directory of the World.

THE WORLD'S MERCHANT MARINE.

NOW that the opportunity has arisen for greatly increasing the merchant marine of the United States—a development which has been desirable for a great many years—it is interesting to glance at the present merchant marine of the leading countries of the globe, and to compare it with conditions a generation ago.

The world's merchant marine statistics issued not long ago by the French Registry Office gave the total number of steamers and sailing vessels forty years ago and at the present time, or, more accurately, just prior to the outbreak of hostilities, as follows:

1874-75 Sailing vessels, 59,280; with average of.....	14,521 tons
Steamers 5,365; " " "	3,424 "
1913-14 Sailing vessels 21,924; " " "	5,630 "
Steamers 17,135; " " "	23,841 "

The following statement is given of the mercantile marines just prior to the war, of England, Germany, France and the United States, in the two classes:

	Sailing vessels, 1914.	Steamers, 1914.
England	4,945	6,594
Germany	1,041	1,510
France	877	612
United States	2,993	1,103

STATISTICS OF STEAMERS.

Figures of the number of mercantile steamers belonging to 16 nations, early this year, were as follows:

	Steamers, 1910.	Steamers, 1914.
England	5,453	6,594
Germany	900	1,510
United States	551	1,103
France	526	692
Norway	657	1,266
Japan	332	803
Italy	258	537
Holland	224	451
Sweden	497	940
Austria	167	315
Russia	435	622
Spain	377	438
Greece	108	312
Denmark	318	470
Belgium	73	132
Various countries	580	890

Thus while England had 6,594 mercantile steamers, Germany had 1,510, France 692, Russia 622, Italy 537 and Austria 315.

THE WAR AND THE ENGLISH RUBBER INDUSTRY.

According to English advices, the ordinary cotton goods trade has been at a standstill, while the demands for government purposes have been of an unprecedented character. This applies specially to goods for hospital purposes.

The rubber industry in general has important orders for the various government departments affected by the war. These include equipment for the motor trucks and commercial vehicles now being ordered largely to replace the horse-drawn vehicles taken for military purposes. Permanent benefit is expected to the rubber trade from the impetus thus given to the motor for commercial purposes. Among the government contracts which have been received is one placed with the Dunlop company for 10,000 pneumatic tires. The Midland Rubber Co., which had been supplying the government's requirements in solid tires for army transports, has had a marked increase of that business. Orders have also been received from the government for miscellaneous rubber products.

The Foreign Trade of the Belligerent Countries.

ONE of the questions naturally suggested at the outbreak of hostilities in Europe has been the effect, immediate and more remote, on the foreign trade of the countries involved. The foreign trade of Germany, of course, for the time being is non-existent, and the commerce of England, France, Austria and Russia is naturally very much reduced. But the particular feature of this situation that interests American manufacturers is to discover if possible how much of this international trade hitherto enjoyed by these different countries can be secured for the United States and how much of this new business will remain permanently in this country after the restoration of peace.

The first step in the discussion of this matter is to review the character and extent of the imports and exports of the European countries particularly concerned. With that in view tables have been prepared, which are given below, showing briefly the entire volume of imports and exports of England, France, Germany, Belgium and Austria, and more particularly the exports of rubber manufactured goods from the first three.

TOTAL COMMERCE OF THE BELLIGERENT NATIONS.

THE table below gives the total imports and exports of the various countries now at war, including merchandise of every kind. The values are given in United States currency.

	Imports.	Exports.
Great Britain, 1913.....	\$3,845,169,795	\$3,175,585,670
France, 1913	1,700,000,000	1,260,000,000
Germany, 1913	2,673,750,000	2,478,150,000
Austria, 1911	667,000,000	516,200,000
Belgium, 1911	870,135,289	691,007,450
Servia, 1911	22,277,105	22,564,856
Russia, 1911	526,690,500	770,555,500

United States, 1913-14 (for comparison): Imports, \$1,893,925,657; exports, \$2,364,579,148.

ENGLISH EXPORTS OF WATERPROOFED GARMENTS.

For the First Six Months of 1913 and 1914.

The value are given in currency of the United States, taking the present exchange basis of a pound, viz., \$5.

To—	1913.	1914.
France	\$37,425	\$49,585
British South Africa.....	65,565	62,995
British East Indies	104,985	118,785
Australia	109,130	146,465
New Zealand	180,115	78,480
Canada	873,235	629,725
Other countries	1,306,487	1,342,540
Total	\$2,676,942	\$2,428,575

ENGLISH EXPORTS OF RUBBER FOOTWEAR.

To various countries not specified. For first six months of this and last year.

	1913		1914	
	Pairs.	Value	Pairs	Value.
British manufacture	620,808	\$275,660	653,268	\$307,685
Foreign and Colonial manu- facture	38,424	30,790	26,616	11,190

ENGLISH EXPORTS OF RUBBER TIRES.

To various countries not specified. For first six months of this and last year.

	1913.	1914.
Rubber tires and tubes, British manufacture.....	\$1,979,925	\$1,493,260
Foreign and Colonial manufactures.....	8,460	8,580

ENGLISH EXPORTS OF OTHER RUBBER MANUFACTURES.

To various countries not specified. For first six months of this and last year.

	1913.	1914.
Rubber manufactures (except waterproofed apparel, footwear and tires), British manufacture	\$4,264,310	\$3,771,925

FRENCH EXPORTS OF RUBBER GOODS FOR 1913.

	Tons.	Value.
Elastic fabric	143	\$587,200
Elastic piece goods.....	35	90,600
Belting, hose, valves, etc., of rubber, whether or not combined with other materials.....	1,509	2,935,000
Card clothing	33½	7,800
Rubber clothing	83¾	384,200
Rubber footwear	65	100,400
Tires, covers, etc., for vehicle wheels.....	4,993	17,826,000
Asbestos manufactures, spun, woven, or molded	2,570	1,218,400

GERMAN EXPORTS OF RUBBER AND ALLIED MANUFACTURES.

THIS table, based on the latest available statistics, shows the annual value of the exports from Germany of crude rubber, rubber manufactured goods, accessory materials and articles with which rubber is closely associated. It shows also the countries to which these exports went.

TO OTHER EUROPEAN COUNTRIES

ENGLAND:	Value.
Raw materials—Rubber	\$1,727,610
Gutta percha	140,125
Accessories—Palm oil, unrefined	952,965
Linseed oil, pure	907,370
Rape seed oil	290,695
Other seed oils	492,005
Plumbago	131,725
Wax (including ozokerit).....	597,270
Pitch, other than coal pitch	181,810
Zinc manufactures	1,308,876
Chemical manufactures (not otherwise specified) ..	5,137,430
Apparel—Including rubber garments	6,529,885
Rubber boots and shoes	189,575
Small wares—Buttons and studs (not of metal).....	1,465,740
Toys and games	5,452,670
Vehicles—Cycles (other than motor) and parts	708,175
Motor cars, motorcycles and parts.....	6,493,040
Electrical—Goods and appliances (other than machines)	4,470,050
Instruments—Scientific apparatus and parts.....	3,264,865
Mechanical—Machinery belting	484,085
Machinery (not otherwise specified).....	7,659,915
Manufactures—Rubber manufactures (not otherwise specified)	1,574,360

NORWAY:

Raw materials—Rubber	468,140
Smallwares—Buttons	130,600
Toys	32,653
Vehicles—Motor cars	132,790
Motor vehicles for passenger traffic.....	9,620
Bicycles and parts	85,305
Electrical—Cables and wire	720,790
Manufactures—Rubber goods	327,991

SPAIN:

Vehicles—Carriages, bicycles, motorcycles, motor cars and aeroplanes	309,156
Electrical—Electrical goods	3,841,238

ITALY:

Instruments—Electrical	9,112,350
Manufactures—Manufactures of rubber	3,029,226

PORTUGAL:

Vehicles, instruments and machinery.....	682,791
Rubber	3,405

ROUMANIA:

Electrical—Cables	595,800
Apparel—Shoes	87,000
Vehicles—Motor cars	114,000

RUSSIA:

Apparel—Clothing, including rubber clothing and buttons	5,511,500
Instruments—Scientific apparatus and instruments...	5,827,845

TO SOUTH AMERICA

ARGENTINA:

Raw materials—Rubber	33,815
Smallwares—Buttons	248,463
Toys	504,910
Electrical—Appliances and sundries	500,759
Accessories for underground cables	392,929
Electric wire and cables	1,272,222
Telephone apparatus	38,562
Insulating tubes	86,825
Instruments—Chemists' sundries and apparatus	402,547
Mathematical and surgical instruments	154,313
Mechanical—Railway materials	246,075
Mining materials	106,404
Cotton belting	124,752
Manufactures—Combs	75,646
Handles, various	15,515
Rubber tubes	101,926
Gutta percha and rubber goods	182,475
Erasing rubber	24,846
Floor cloth	86,617

BOLIVIA:

Manufactures generally	5,203,631
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BRAZIL:

Accessories—Chemicals	1,901,203
Smallwares—Buttons	135,585
Toys	489,224
Electrical—Cables	51,501
Instruments—Scientific instruments and articles	197,076
Mechanical—Rubberized plates and sheets	4,153
Manufactures—Manufactures of rubber	297,622
Medical—Surgical instruments and articles	197,076
Dental instruments and articles	24,526

PARAGUAY:

Apparel—Clothing	37,595
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TO NORTH AND CENTRAL AMERICA

CANADA:

Apparel—Braces and suspenders	1,326
Smallwares—Buttons and materials	43,837
Manufactures—Combs for dress and toilet	69,228
Elastic, round and flat	612
Crude—Rubber and gutta percha, free	53,087
Manufactures—Rubber and gutta percha manufactures (not otherwise specified)	50,463
Smokers' articles	11,426
Webbing, elastic and non-elastic	13,174

PANAMA:

Textiles—Textiles and textile manufactures	123,771
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NICARAGUA:

Rubber and celluloid goods	2,504
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CUBA:

Details not specified—total imports from Germany	7,847,765
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COSTA RICA:

Details not specified—total imports from Germany	1,785,591
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TO ASIA, AFRICA AND AUSTRALIA

INDIA:

Vehicles—Cycles	77,905
Motor cars and motorcycles	195,760
Rubber manufactures	74,285

CHINA:

Raw materials—India rubber and gutta percha	3,204
Smallwares—Toys	24,192
Electrical—Electrical materials and fittings	360,652
Vehicles—Motor cars	19,950
Motorcycles	2,022
Velocipedes, bicycles, etc.	7,150
Instruments—Instruments and appliances	72,264
Mechanical—Machine belting, etc.	6,780
Manufactures and apparel—Manufactures, including boots and shoes	19,642
Tobacconists' sundries	12,715
Toilet requisites	8,760

PERSIA:

Details not specified—total imports from Germany	388,285
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EGYPT:

Details not specified—total imports from Germany	7,783,245
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JAPAN:

Raw materials—Crude india rubber and gutta percha	10,425
Asbestos and manufactures	36,429
Apparel—Suspenders	1,267
Smallwares—Toys	30,091
Vehicles—Automobiles and parts	93,690
Cycles and parts	205,185

Electrical—Insulating tape	1,410
Insulated electric wire, armored	681,630
Telegraphic or telephonic instruments and parts	5,114
Mechanical—Woven machinery belting and hose	100,338
Card clothing	23,283
Manufactures—Elastic webbing	30,024
Manufactures of india rubber and gutta percha	73,313
Textile—Tissues not otherwise provided for	2,401
Medical—Waterproof tissues	1,610
Surgical or orthopedic instruments	34,876

NORTH RHODESIA:

Smallwares—Toys and fancy goods	2,955
Electrical—Electrical fittings (not otherwise specified)	1,030

SOUTH RHODESIA:

Electrical—Electric cable and wire	15,935
Mechanical—Engine packing	8,120

SOUTH AFRICA:

Raw materials—India rubber	13,240
Asbestos and manufactures	5,575
Apparel—Shippers, plimsols, Chinese footwear, etc.	8,610
Smallwares—Toys	221,975
Vehicles—Bicycles, tricycles, etc.	71,715
Mechanical—Conveying hose	39,050
Machine belting, etc.	14,980
Battery cloth	2,215
Engine packing	24,495
Medical—Surgical and dental appliances	17,740

AUSTRALIA:

Accessories—Glue and cements	25,375
Apparel—Clothing (including rubber garments)	2,013,790
Vehicles—Bicycles and parts	52,900
Electrical—Electrical and gas appliances	304,610
Electrical materials	296,440
Mechanical—Rubberized belting	13,150
Rubbered leather	7,445
Manufactures—Printers' material	448,695
Toilet combs	60,515
Floor cloth	30,470
Textile—Rubbered waterproof cloth	1,109,195
Medical—Optical, surgical and scientific instruments	500,570

NEW ZEALAND:

Apparel—Apparel, including hats and caps	23,905
Vehicles—Autos, motor cars, etc.	90,735
Bicycles and tricycle fittings	9,750
Manufactures—Fancy goods and toys	185,265
Rubber and celluloid goods	12,520

GERMAN VIEWS OF THE WAR.

German reports indicate that the rubber factories producing goods for the army have been very busy in some departments, such as sanitary and hospital supplies, bicycle and automobile tires, and the accessories of aviation. This occupation will, however, it is considered, hardly offset the loss of regular business in other departments.

The most important German rubber works are provided with a supply of crude rubber for the next few months. As, however, the military authorities have seized all the available benzine, benzole, etc., there is a dearth of solvents.

A German rubber expert thus expresses his opinion as to the situation:

"The success achieved so far by our arms leads us to hope for the early conclusion of peace. It is in that case not to be doubted that our industry will again be busily occupied, and that it will succeed in making up for the severe losses caused by the war, besides making a progressive development.

Although in a more favorable position than that occupied by fancy goods, toys and industries dependent on fashion, the manufacture of rubber goods was much affected by the outbreak of the war. The lack of skilled workmen, drafted for the war, has been severely felt."

GERMAN EXPORT PROHIBITIONS.

According to German official proclamations of August 27 and 31, explanatory of previous notices, the following articles are subject to prohibition of export and transit commerce:—surgical wadding and gauze, rubber for goods for drainage tubes, bandages, etc., as well as surgical instruments and appliances. Asbestos, graphite, rubber waste and cleaning wool are likewise included in the export prohibition.

BRAZIL AND THE WAR.

By our foreign correspondents.

EVENTS have passed in rapid times. Within ten days of the declaration of war the "Revista" of the Amazonas Commercial Association at Manaus published a liberal discussion of the question, while ten days later, the Pará Commercial Association at a special meeting, considered the effect of the war.

The "Revista" stated that it was as yet impossible to foresee what other nations would be drawn into the conflict, nor to predict its duration and probable effects. It was added that Amazonas would suffer from the disturbance of the world's financial centers and from the derangement of navigation, upon which it relied for the distribution of its products, being dependent on the outside world as to imports and exports to a greater extent than any other Brazilian State.

Among the earlier acts of the association was to oppose the arbitrary rise in the prices of food-stuffs, on which subject assurances were received from retailers and distributors that it was only contemplated to make such advances as were absolutely necessitated by the increased cost of provisions and the fluctuations of exchange.

Under these circumstances the "Revista" urged the taking up of other products instead of limiting the activity of the State to rubber, as had been the case for nearly half a century. Amazonas now had an opportunity of realizing a fair price for its rubber in view of the conditions of the markets of consumption.

As previously announced, the meeting of the Pará Commercial Association was held on August 19 at its new quarters, being composed of landlords and rubber merchants. The chair was occupied by Senhor Rebello, Jr., president of the association, who explained that the object of the meeting was to find ways of meeting the present crisis. Two courses were presented: That of the State government, which proposed through the intervention of a bank to buy the rubber coming on the market and to ship it to America; or the plan of J. Marques that his firm should act as intermediary for all the consignments of the article, shipping it to America on account of the different owners. It would receive 8 per cent. with one per cent. commission. The firm of J. Marques would advance 80 per cent. of the market value to the owners of the rubber.

After the two proposals had been read to the meeting Senhor Rebello commented on them. He expressed disapproval of that submitted by the government of the State and favored that of J. Marques, stating his cooperation with a view to its acceptance.

MORANTZ'S LAW.

The principal clauses of the "Morantzum" law, enacted on August 1, by the National Congress provided for the granting of a maximum extension of payments, ranging from 30 to 120 days, of obligations resulting from bills of exchange, promissory notes, and drafts for their non-payment, and it subjected exporters to a 10 per cent. tax.

AMAZONAS RESERVISTS RETURN HOME.

Senhor Rebello explained that his return to Manaus was due to the fact that it was his duty to return to his home, and that he was not able to continue his efforts. Rates for the voyage from Manaus to Belém were 100 reis for the war.

NINE BRAZILIAN VESSELS.

Mr. Morgan, in a speech before the Chamber of Deputies, stated that the Brazilian government had declared its neutrality and will maintain it, and that it was not possible for the Brazilian government to send vessels to the war.

THE RUBBER COUNTRY.

The rubber country is a vast area, covering the entire Amazon basin, and is the source of the rubber supply for the world. The principal

countries containing a German population are: United States, 2,000,000; Russia, 1,800,000; Brazil, 400,000; France, 500,000; Canada, 300,000; England, 100,000.

The "Folha do Norte" of Pará, lately wrote: "We Brazilians owe the Germans perhaps more than we do any other nation. We are, however, not Germans, nor French, nor Russians, but above all Brazilians. Being in many cases descended from Germans, we have to treat our progenitors with respect, while maintaining complete neutrality in this European struggle."

NEUTRALITY OF BRAZIL.

In the early days of August the Brazilian Government issued a decree asserting the neutrality of that country during the present struggle. This attitude has been strictly observed by the press and in official circles. The movements of the reservists in following the calls of their respective countries have been in no way impeded by the federal authorities.

PAOLO CORDELLIER GONE TO THE FRENCH ARMY.

M. Paolo Cordelier, local representative for the rubber firm of De Lagotellerie & Co., has left Pará for Europe to join the French colors. A substitute was transferred from Manaus to take his place.

INTERRUPTIONS OF STEAM COMMUNICATION.

At an early date during the hostilities the Lloyd Brasileiro issued a notification that during the war there would only be three departures on the monthly Northern service, the steamers leaving Rio on the 10th, 20th and 30th of each month.

The Northern and Eastern services of the Booth line were suspended until August 6, when orders were received by wire to resume sailings, both for America and Europe.

BRAZILIAN COAL.

In view of the prohibition of English coal exports, attention has been given in Brazil to the geological studies made in the United States and Germany of Brazilian coal, with a view to its utilization in the natural state or as briquets. An analysis shows: Ashes, 35 per cent.; sulphur, 3 to 5 per cent., and moisture, 5 to 11 per cent.; the remainder being composed of carbon and volatile substances.

RUBBER STOCKS IN PARÁ.

Statistics to July 31 showed the following situation:

June 30 stock	2,012
July receipts	1,370
July shipments, Para to America	3,382
July shipments, Para to Europe	1,203
July shipments, Para to Europe	800
	2,102

Stock July 31 1,280

This quantity was composed of 250 tons in first hands and 1,024 tons in second hands. The latter quantity included 798 tons in the hands of the Bank of Brazil, and 70 tons each with Messrs. Zarges and J. Marques. The remainder was in the hands of smaller holders.

Para receipts from August 1 to August 20 were 615 tons (560 rubber and 49 caucho). This total shows a comparative decrease from that of the entire month of July of 1,370 tons.

BRAZILIAN VESSELS FOR TRADE INTERCHANGE.

Ambassador Edwin V. Morgan cables from Rio de Janeiro to the Bureau of Foreign and Domestic Commerce at Washington that the Minister of Finance of Brazil is arranging to dispatch to the United States five vessels of the Brazilian Lloyd with consignments of coffee from Santos and Rio de Janeiro, and rubber from Pará, which are returning back cargoes of prime necessities.

The writer, in an opinion on South American rubber—"The Rubber Country of the Amazon," by Henry C. Pearson.

Rubber Aboard the Fighting Fleet.

THE rubber markets are generally sorely taxed but to long to meet the needs of the battling navies of the world and to make up the losses incurred to warfare all at. The public at large does not know it, but this material of nature's providing plays a large part in making the man-of-war the efficient fighting machine it is today. Indeed, if one were to reduce its varied uses to a question of pounds, every first-class dreadnought would show its indebtedness to the measure of many tons.

The more formidable India rubber serves to make the battle-craft the further that vessel goes toward maintaining peace on, when that becomes impossible. England with her fleet has made it reasonably safe for her merchant craft to maintain their trade routes with but little fear of hostile interference, and it is

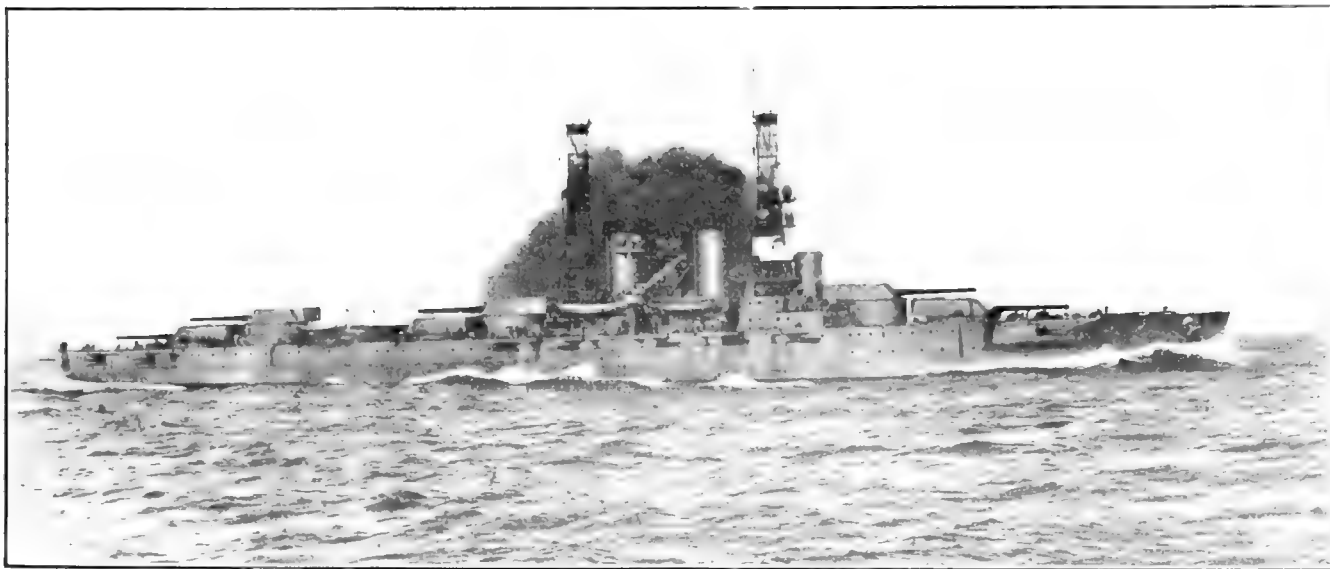
when an extensive subdiaphragm being constructed to divide a number of narrow areas of moderate spaces. It is constructed in an inner bottom, and the internal spaces are divided into small compartments and each made airtight, so as to

susceptible of inspection. This inspection is necessary in order that the steel spaces are not rusted away by the paint and corrode the plates to dangerous thickness. Hence the need of rubber in these subdivisions, and to a great extent a watertight closure is, however, made watertight by employing gaskets or collars of the best rubber in packing system. On a larger scale, the ship is partitioned off by bulkheads of steel, and in order

to facilitate inter-communication between these active centers for in these spaces are placed engines and boilers and auxiliaries in different compartments or their own, there are



CRUISERS WHICH HAVE LED THE WORK IN WATER-PROOFING ON SHIPBOARD.



CRUISERS AND DREADNIGHTS.

ONE OF THE LARGEST DREADNIGHTS.

doubtful if her dreadnoughts and her battle-cruisers could do this without the helpful service of rubber in manifold directions.

The modern man-of-war is a gigantic steel hove-mill, the

sliding or swinging doors, the closing of which, when closed, should be absolutely watertight. They would not be watertight, in fact, without the aid of rubber.

but for the rubber used. In these two directions alone, not to mention others, the safety of a ship in time of accident mainly depends, for a leaky manhole or an insecure door might easily lead to grave consequences if not to the loss of the craft itself.

But a ship that can keep the sea in all kinds of weather, either

no less than the amount required must be used to meet this gauge of efficiency. Piston rods and valve stems must not exude an excess, and here is where rubber packing saves the day. The coal and water problem is a still nicer one. Salt water is not used in marine boilers. The ship starts upon her voyage with

her boilers charged with fresh water and with a reserve supply in suitable tanks or in the double bottom spaces. When more is needed, it is obtained by distilling the sea water. Distilling sea water calls for heat in the form of steam, and the steam is produced by the coal or the oil fuel, as the case may be. It is surprising what a leaky joint in a hot water pipe or a small escapement in a steam feed or a stuffing box will represent in the way of waste in the course of twenty-four hours. Therefore, only the best of rubber packing will answer.

Of course, many of the decks not exposed to the weather are covered with rubber tiling and rubber mats at the foot of ladders and the approaches to heavy steel doors are a necessity, likewise so are the treads on gangways covered to prevent slip-



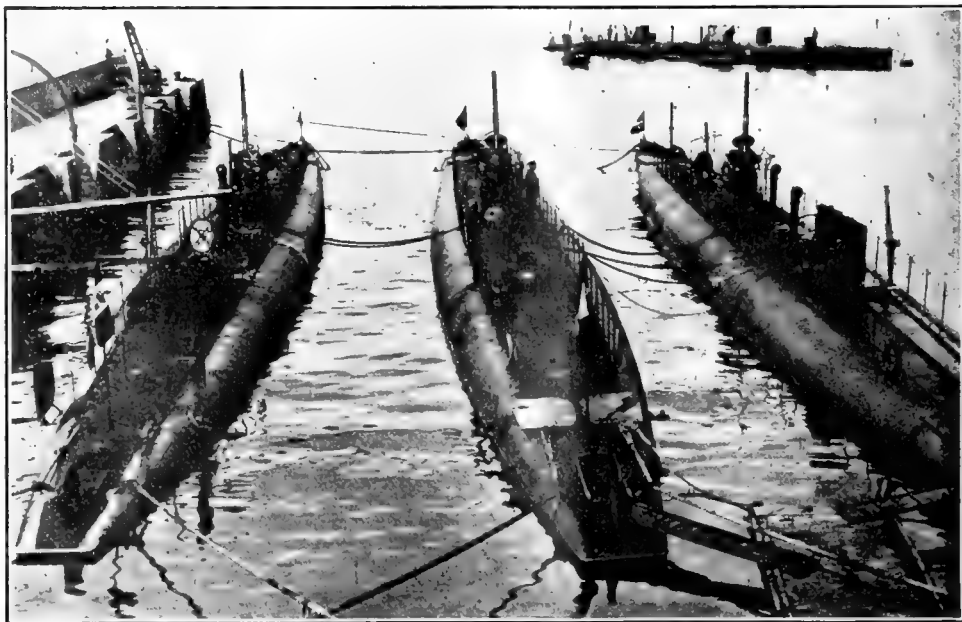
HOW THE UNITED STATES NAVY LAYS NAVAL DEFENSE MINES.

guarding the paths of commerce or pursuing the foe, must be something more than merely secure below decks. It is quite impossible for her to drive along into heavy seas and to have her decks smothered with the great tumbling masses of water unless her hatches and her sky lights as well as portholes be proof against the sea's invasion. Here, once more, rubber packing and rubber seatings meet the emergency and make it possible to close these openings perfectly. But there must be communication at many points beneath the waterline between the sea and the interior of a man-o'-war. Some of these openings are for the purpose of flooding compartments in case of fire,

others are passages by which the sea water can be drawn into the ship for a variety of services. In every case, however, a suitable valve stands sentinel between the breach and the inner vitals of the craft, and that these valves may be tight when closed, rubber packing is employed. Indeed, one might go on interminably and enumerate these necessary but not spectacular services of india rubber, but enough has been said to show how the fundamental fitness of the ship as a structure hinges in certain essential particulars upon the part played by this valuable material in the humble form of mere packing.

When it comes to the activities of the craft, such, for instance, as the motive machinery, then rubber packing of a different sort is demanded. The modern dreadnought carries steam at a higher pressure than that generated by the boiler, and a tremendous amount of scorching energy has to be held within bounds at every joint, stuffing-box, etc. A premium is paid to the engineering force in our men-o'-war which keeps its consumption of coal and water and oil below a certain standard or maximum. Oil is sent into the machinery for lubrication under pressure and no more and

ping as the fighting men hasten up and down upon their various missions. Rubber stops keep doors from banging, and similar buffers check the blows of the innumerable ponderous masses that swing and move in their different services on shipboard. Naturally, there are miles of rubber hose for cleaning decks and for battling with fire, and Jacky must have his rubber boots as well as his rubber clothes in order that he can stand watch when the storm blows and the stinging spray sweeps the ship from stem to stern. Down in the sick bay and the dispensary the surgeon has his rubber bandages, and vulcanized rubber utensils of many sorts, not to mention rubber tubing and the insulations



A FLOTILLA OF ITALIAN SERRAMARINES.

of his X-ray equipment. Indeed, rubber is just as much present there as it is in the operating room of a large hospital, for the ship's surgeons have a crew of more than a thousand to minister to in the biggest of up-to-date dreadnoughts. There are scores upon scores of lesser directions in which rubber is alone ade-

quate on a fighting ship, but these cannot all be detailed here.

In the strictly fighting end of the naval vessel, rubber meets the needs as nothing else will, and the wonderful precision of the modern naval artillery is very largely due to the aid rendered by this material. The gun pointer, or rather the gun pointers, for there are two of them for each big gun, are the men that



MAKING THE RUBBER CAPPED "EYE" FOR THE GUN POINTER.

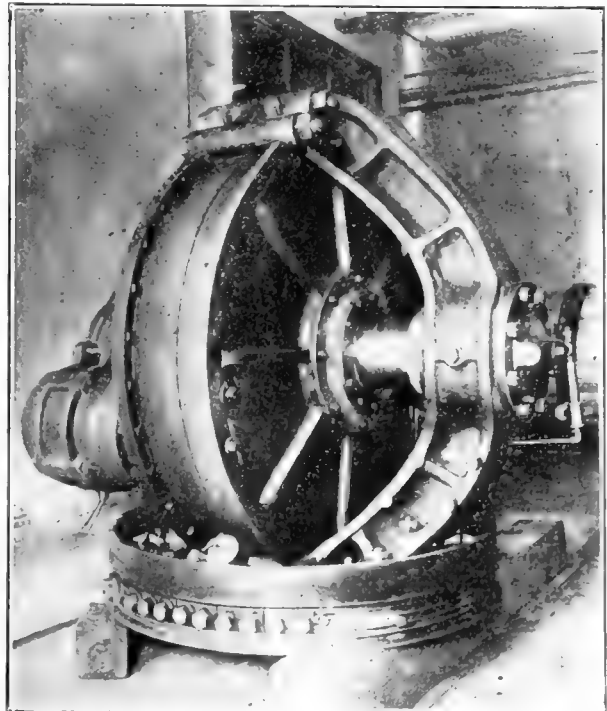
keep the muzzles of the weapons pointing steadily at the target anywhere from 10,000 to 16,000 yards away. No matter how their ship may roll, it is their duty to swing the rifle to right or left or up and down—one man controlling the horizontal movement while the other controls the vertical—holding it always straight at the object far away. To do this, these pointers must hold their eyes pressed against a telescopic sight, holding them there even when the gun is fired and the sight jarred by the shock of the explosion. But for the cushion of soft rubber the men's brows would be cut to the bone and their expert usefulness destroyed in a few moments. Again, the small, rapid-fire guns, those spit-fires that are designed to destroy submarines and to keep other torpedo craft at bay, have a habit of jarring their pointers in recoil something after the fashion of a kicking mule. No human shoulder could stand this pounding but for the intervening pad or tubular buffer of rubber provided.

The latest mechanical device designed to help the man behind the gun is a telescope that "floats" horizontally, no matter how the ship may pitch and roll, because it is mounted upon a small stabilizing gyroscope. This mechanism is placed in the so-called "spotter tops" of the military masts, where crouch the men who watch the splash of the range-finding shots and telephone below how much "over" or "short" the gunners have estimated the distance. The spotters trace the fall of the projectiles through these telescopes, even though the mast tops are sweeping through wide arcs like agitated whips. The stabilizing gyroscopes that make this service possible are driven by wee electric motors, and only the perfect insulation of rubber makes their performance possible. This brings us to other uses of the gyroscope on ship-board and, incidentally, to the employment of rubber insulation. The gyroscopic compass is rapidly displacing the old magnetic compass aboard men-o'-war, and the gyroscope is now employed to record at various places in a ship diagrammatically the way

the craft is turning in relation to a fixed point which cannot be seen but toward which the men of the torpedo tubes must set their weapons ready for launching. But the most startling use of the gyro is for stabilizing a vessel so that she will roll but little even when the sea is very rough. One of our illustrations shows one of two gyros fitted to the United States torpedo boat "Worden," and the manner in which they performed has blazed the way for their use on battleships. Apart from insulating the electrical connections, rubber also serves to make air-tight the casings in which the gyros are spun in a partial vacuum.

We have heard much about the submarine mine and the torpedo of late, but it is highly probable that many do not know the ways in which rubber makes these weapons of destruction the sinister instruments they are. In the automobile torpedo rubber packing is extensively used and necessary, but it is not of that we want most to speak. The torpedo would not fulfil its mission properly if it could not run at a uniform depth below the surface of the sea—that depth being far enough down to get below the protecting belt of armor and to hit a ship where she is least able to withstand such a blow. The depth-regulating device consists fundamentally of a diaphragm of soft rubber directly exposed to the pressure of the sea water on the outside and to the thrust of a spring on the inside, all the while keeping the water from getting into the body of the torpedo and thus altering its nicely adjusted buoyancy. The pulsing of this rubber diaphragm is the means by which the rudders controlling submergence are operated. In the submarine mine, the prime service of rubber is one of insulation, but there are forms of these weapons that are likewise held at a predetermined depth through the action of a rubber diaphragm akin to that in the torpedo except that the actual buoyancy of the mine is juggled. Of course, we are speaking of naval mines and not military mines which are operated from a shore station.

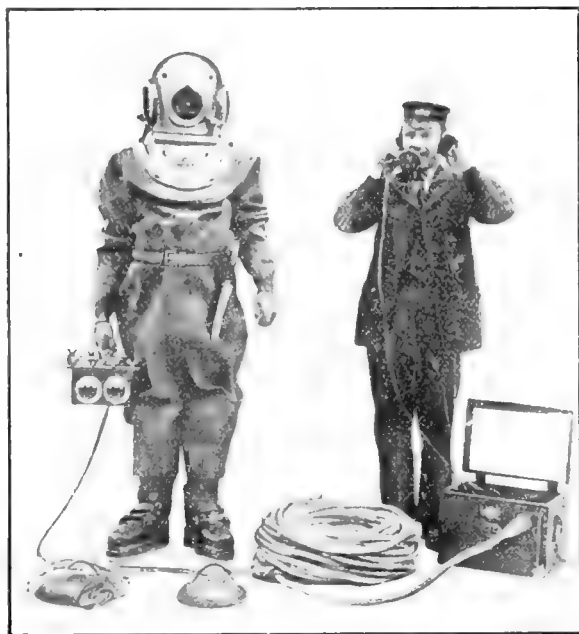
As must be recognized, every fighting ship today has a wide and varied electrical installation, and none of this service would



ONE OF THE BIG STABILIZING AND ROCKING GYROS. THE SPINNING WHEEL IS INSIDE OF THE CYLINDRICAL CASING. NORMALLY IT ROTATES IN A FORE-AND-AFT PLANE, BUT WHEN TURNED FROM SIDE TO SIDE IT EXERTS A PUSH LIKE THE SHIFTING OF TONS OF WEIGHT UPON THE DECK OF A VESSEL.

be possible but for rubber in one form or another, and the United States Government, as do most other maritime nations, imposes a very high standard for all of these preparations. The submarine is entirely electrical in its propulsion when submerged, and only the very best of insulation is permissible, for a chance spark through any defect would be pretty certain to invite disaster if not destruction. So, too, the hull must be kept perfectly watertight and all hatches must be so fashioned that their covers can be screwed tight against seatings of the best of soft rubber packing. A leak of sea water might be quite as dangerous as a short circuit, because if that water found its way into the storage batteries it would lead to the generation of that insidiously suffocating chlorine gas which has already asphyxiated more than one submarine crew.

No up-to-date ship of war is complete without her wireless outfit, and the readers of THE INDIA RUBBER WORLD know already



DIVING OUTFIT.

how much rubber helps to make this wizardry of the air possible; and just as messages go and come through the atmospheric ocean so, too, knowledge of what is happening in the depths is sometimes quite as necessary to the warship. If the craft be injured below water, if there be some doubt as to the structural condition of her bottom, or if an anchor be fouled or lost, then a man must be sent overboard for inspection or for search. Here is where the naval diver fulfils his mission, and here, likewise, is where rubber makes his important work possible.

WHERE DID THEY COME FROM?

TO THE EDITOR OF THE INDIA RUBBER WORLD, DEAR SIR:

A New York newspaper man passing an establishment which combined the functions of a retail hardware store and a junk shop saw a window full of queer looking objects and carrying that illuminating placard: "Do you know what they are? We don't, but we have a lot of them and are going to sell them at a quarter each if we can find anybody fool enough to buy them." The newspaper man did not fit the description of the desired customer, but the mystery weighed upon him until good fortune brought him to the fount of knowledge which overflows in the pages of THE INDIA RUBBER WORLD. He saw a picture and from that moment he knew more than the junkman. It was an india rubber tapping knife.

"HENDERSON RUBBER."

FOR years the object of a certain group of chemists has been the manufacture of a synthetic rubber. The methods of approaching this subject vary greatly, but the ultimate object has always been a chemical compound having all the characteristics and the same chemical composition as true rubber. What is known as "Henderson Rubber" is an entirely new product; it is not a synthetic rubber nor is it a rubber substitute.

Its basis is raw hide scrap. This as it comes from the dealer is very hard and tough and difficult to cut or work with ordinary tools. The scrap is first treated to remove all impurities, and is then given a further chemical treatment which partly breaks down the hide. This reaction is accompanied by a change of the relation of the atoms in the molecule and what appears to be a colloidal arrangement is set up. The material is then in a very unstable condition and must undergo further treatment which results in a product of great stability. The treatment not only preserves and stabilizes the substance but also has an effect in the finished product on its affinity for true rubber. The product is then cleaned, masticated and sheeted out and is ready for the market.

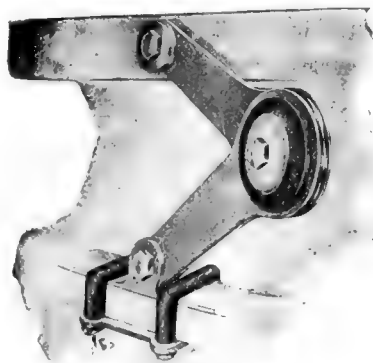
It has the appearance and many of the characteristics of light plantation crêpe. It is tough, very nearly as elastic, and may be worked in the same way. Used in rubber mixings it is said to increase tensile strength and resiliency. It is used in the same manner as rubber, except that a certain percentage of rubber should be present in soft goods if the product is to be vulcanized.

Henderson Rubber, it is claimed, resists oxidation and keeps down deterioration, thereby increasing the life of the article. When used with reclaimed rubbers of all grades it is said to improve their quality very materially and also to have the faculty of taking up a large percentage of minerals.

Its uses, so the manufacturers assert, are as varied as those of rubber and it may be used to advantage wherever rubber is used, either in soft or hard goods. It is on the market and is being used in molded goods, frictions and surfaces for belting, auto-casings and tubes, hard rubber and ebonite goods.

RUBBER DISC SHOCK ABSORBER.

The majority of the automobile shock absorbers that have been placed on the market in the past operate either by means of steel spring resistance or by the friction of steel discs. However, here



THE SHOCK ABSORBER WITH THE RUBBER DISCS.

is a newer type of shock preventer which takes up the shock of the road by virtue of the graduated resistance of a series of rubber discs. The illustration shows one of these devices set above the spring between the axle and the frame of the car, to control the action of the spring as it moves up and down. The device comprises a series of inclined planes of high carbon steel working against discs of brass on the principle of the wedge. As these wedge-like discs operate, they expand and contract other discs of rubber. This rubber cushion rapidly increases in resistance the farther it is compressed, so that a heavy shock meets with a corresponding resistance while a light shock encounters small resistance.

What the Rubber Chemists Are Doing.

SOME AMERICAN WORK ON SYNTHETIC RUBBER.

IN the "Journal of the American Chemical Society" (April, 1914), L. P. Kyriatides describes some highly technical work which is of interest to the rubber industry, as it indicates a possible method of making synthetic rubber, and were it not for the high cost of the raw materials used and the complicated and costly process of manufacture it might be of commercial value.

The first article is entitled "Observations on some Barbier Grignard Reactions." The reaction relates to the action of ethyl-magnesium bromide on various substances and in this case chlor-acetone was the substance acted upon. This reaction produces oxides. The author has improved the original method by substituting ethyl-chloride for the ethyl-bromide which was used in the original Barbier Grignard process, being acted upon by metallic magnesium in the cold in ethereal solution. The author claims that by substituting the ethyl-chloride excellent results were obtained.

The product of the reaction was methyl-butylene-oxide. In the following article, entitled "New Process for the Preparation of Unsaturated Hydrocarbons with Conjugated Double Bonds," it is revealed that these are attempts to make synthetic rubber, as the "conjugated double bonds" are the necessary characteristic of all the proposed raw materials.

The sub-head of this latter article is "Pyrogenetic Decomposition of Oxides." A number of experiments was tried, but the successful one was the dehydration of methyl-butylene oxide made by the previous process by distillation through kaolin heated to 450. The reaction was carried on in a vacuum with an absolute pressure of less than 1 mm. The hydrocarbon (isoprene) showed a constant B. P. of 35-36. This liquid was treated with a coil of sodium wire and thus polymerized according to Harries' directions. A tough product was obtained which vulcanized to a product resembling leather more than rubber.

This seems to be about the only work done on synthetic rubber in America. At least it is the only work the results of which have been given to the public and, taken in connection with Patent No. 1,106,290 of August 4, 1914, and previous patents No. 1,094,317, 1,094,223, 1,093,922 and 1,093,923, which were granted to L. P. Kyriatides and R. B. Earle, and assigned in each case to the Hood Rubber Co., it shows at least some attempts by Americans to make some progress in a line which has been heretofore monopolized by Europe.

PROPERTIES OF RUBBER SOLUTIONS.

W. A. Caspari has been doing extensive experimental work on the osmotic properties and physical constants of caoutchouc solutions. This is published at length in the "Journal of Chemical Society" (London) for August, 1914, pp. 2141-2150.

He states that while the osmotic pressures exerted against a semi-permeable diaphragm by various colloids in aqueous solution have been frequently determined, their real significance is a matter of some doubt, owing particularly to the usual presence of some small amount of foreign electrolytes. But when the solvent is non-ionizable matters are simplified and extremely viscid solutions like caoutchouc may show peculiarities of their own.

Osmotic pressure measurements are usually for the purpose of determining the molecular weight, but are more reliable when the solutions approach the character of crystalloids. The cryoscopic and ebulliscopic methods usually fail to measure osmotic quantities of colloids, but by direct measurement of the pressure inside a semi-permeable septum greater delicacy is obtained.

The following figures were obtained with fresh caoutchouc in benzene:

Percentage in Solution	Pressure M. M.	Atmospheres	Viscosity
5.26	45 (Hg.)	.059	....
3.59	360	.030	....
2.95	251	.021	....
2.10	137	.011	3.196"
1.48	77	.006	989"
1.01	42	.003	374"

Here it will be seen the osmotic rise increases faster than the concentration. The viscosity was determined by the flow through the capillary tube of the Ostwald viscosimeter. On deviscifying the caoutchouc by boiling the solution for 80 hours the following figures were obtained:

Percentage in Solution	Pressure M. M.	Atmospheres	Viscosity
9.95	37 (Hg.)	.048	287"
6.89	330	.028	150"
4.11	165	.014	68"
2.06	71	.006	35"

In both cases the osmotic rise seems to depend on physical condition rather than the concentration. To prove this viscous solutions were put on one side, the osmometers and the deviscified solutions of same strength on the other. Also, the depression of freezing point in benzene solution is so small as to be of little value.

In experimenting the author used benzol and gasoline (boiling point 80°-120°) for the permeable diaphragm. Cylindrical cells of white porous earthenware were found suitable; for their solution the cell pores were blocked with cold vulcanized caoutchouc. This was done by soaking them in 10 per cent. solution of deviscified caoutchouc, placing them under a vacuum to remove air. Then after a few hours' more soaking they were immersed in sulphur chloride to cure.

The osmometer was of glass, consisting of a widened part with stopper like the top of a bottle cemented into the earthenware cell, and a manometer tube came out the side of the glass top. This whole arrangement was lowered into a wide cylinder containing the outer solvent. Deresinified plantation rubber was used containing about 3 per cent. nitrogenous and mineral matter.

The more viscous solutions invariably showed an osmotic rise against the less viscous. Similar experiments were made with gutta percha. Considerable speculation is indulged in in accounting for the results obtained, but it appears that the final conclusions were that a convergence of the molecular weight values of caoutchouc towards 100,000 is indicated and gutta percha is shown as 40,000, which is considerably smaller.

SWELLING OF VULCANIZED CAOUTCHOUC.

F. Kirchof (Kolloidchem Beih., 1914, 6, pp. 1-22. Also in the Jour. Chem. Soc., August, 1914, page 633) has examined the swelling of vulcanized rubber by measuring the increase in weight of thin discs of Pará after immersion in benzene, carbon tetrachloride, carbon bi-sulphide and benzine (naphtha of .74 sp. gr.).

The results show that the maximum swelling of caoutchouc decreases as the vulcanization increases. The maximum swelling was attained in 24 hours. The specific influence of each liquid runs parallel with the solvent power. The swelling velocity increases slowly with the rise of temperature. The relation between the extensibility and the vulcanization coefficient is similar to that existing between the swelling capacity and the degree of vulcanization.

THE VISCOSITY OF RUBBER SOLUTIONS.

D. Spence and G. D. Kratz (*Kolloid Zeit.*), 1914, p. 262, have shown that the viscosity of a rubber solution may be lowered to almost that of the solvent, and then the insoluble nitrogenous portion may be easily separated. Sunlight and heat assist in reducing viscosity. One hundred grains of washed and dried rubber were treated with 1S. of benzine containing 0.3 to 0.5 per cent. of tri-chloro-acetic acid and warmed. After 48 hours with occasional shaking it was settled, decanted, washed with the solvent, then with pure benzine, then dried and extracted with benzol, washed with alcohol and dried.

In four samples plantation rubber gave nitrogen as follows: 9.83 per cent., 10.90 per cent., 11.58 per cent. and 12.08 per cent. It is soluble in 1 per cent. Na.O.H. and precipitates with dilute acid. It agrees in nitrogen contents and reactions with the glucoproteins.

Hard cure Pará gave 7.75 per cent., 9.6 per cent. and 10.3 per cent. nitrogen. The insoluble constituent of balata contained 5 per cent. N. and specimens of proteins from *Funtumia elastica* showed N. 9.5 per cent. and 11.5 per cent. These results establish the fact that the nitrogenous constituent of rubber is a complex of protein and carbo-hydrate—probably a gluco-protein. The proper factor for nitrogen is probably 10 instead of the usual 6.25.

Clayton Beadle and H. P. Stevens seem to have carried out an extensive series of tests on viscosity of Pará rubber and at the same time tested vulcanized samples of the same rubbers. They have contributed a rather voluminous article in the "Chemical World" (London) of August, 1914, but a large part of it is devoted to comments on previous work of themselves and other authors, and no detailed figures are given to show just what their results were.

THE UNION OF SULPHUR WITH RUBBER.

Mr. F. Ahrens, in "Gummi-Zeitung," No. 28, p. 490, makes a contribution to the vulcanization of rubber in which he points out that rubber does not add sulphur in the ordinary conception as charcoal does in the case of dyes, gases, etc. He thinks that blooming shows the presence of a "solution product" and a "reaction product." The relation of the two changes continually until equilibrium is reached, the chemically combined sulphur increasing and the free or dissolved sulphur diminishing in amount. He claims the phenomenon of reversed action is frequently noticed in vulcanized goods. As an example he cites the analysis made of two identical samples, one analyzed directly after making and the other analyzed after aging several months. The rubber used was low grade. In the fresh sample the total sulphur was 15.80 per cent., acetone soluble sulphur 7 per cent. and combined sulphur 5.9. In the old sample the total sulphur was 13.60 per cent., the acetone soluble sulphur 9 per cent. and the combined sulphur 2.83 per cent. This seems a remarkable change in composition and one not often observed. The author thinks that the old sample has eliminated the sulphur as H_2S . The decrease in combined S. tends to the conclusion that this is less firmly bound in the old sample. Pará is said to show much less variation, and it is concluded that the particular nature of the Colloid requires the S. to be present in something more than the mechanically dissolved state.

The Industrial Chemical Co. with executive offices at 200 Fifth avenue, has recently erected a new plant with a capacity double that of the old one. This company makes "Alba Whiting" a specially prepared rubber white, so well adapted for rubber compounding use that this department of the business has increased 100 per cent. within the past two years. It is claimed to be economical both in cost and continuous use. This company also makes an excellent grade of rubber black.

SUBSTITUTE FOR RUBBER AND GUTTA PERCHA.

THE increasing use of both india rubber and gutta percha has turned the attention of industrial chemists to the production of substitutes therefor; and among these is a series which has been brought out by Dr. Zuhl and Herr Zimmermann, of Berlin. The intention is, of course, to produce a substitute for the two flexible vegetable substances, which shall have the same chemical and physical properties and be equally valuable for insulating against electricity. It is based on the fact that Chinese wood oil, which, as is well known, when heated at high temperatures is transformed into a mass resembling caoutchouc, can also be similarly changed when treated with chloride of sulphur. If the wood oil in question is mixed with resin or resinous substances, as for instance pitch, asphalt, or the like, and then subjected to the action of chloride of sulphur, there will be produced a substance which may be employed in the same manner as india rubber or gutta percha. It is desirable to heat the mass thus obtained to about 160 degrees C., after mixing it with a certain percentage of sulphur.

If it be desired to make artificial gutta percha, pitch, asphalt or similar substance—better still, paraffin wax—should be added to the resin before these are added to the wood oil and heated. Or the oil may also be treated with the sulphur chloride, and then the pitch, resin, etc., added. A less convenient method, but which also leads to good results, is said to consist in heating the mixture of resin, pitch or the like, with the wood oil to 200 degrees or 300 degrees C. for a long time, and then vulcanizing.

The proportions given in the German patent papers (No. 119,635) are as follows:

For making gutta percha: Two kilograms of paraffin wax are melted with 6 of pitch, $2\frac{1}{2}$ of wood oil added, and the mass stirred until thoroughly homogeneous. Then 1.1 kilograms of sulphur chloride are added slowly and well stirred; next, about 100 grams of fine pulverized sulphur, and the mass is then heated about one hour to 160 degrees C.

For making india rubber, 2 kilograms of pitch are mixed with 1 kilogram of wood oil and heated under pressure about 8 hours to 280 degrees C. The product is vulcanized with 250 grams of sulphur chloride.

A subsequent process, tending to increase the tensile strength of the products, consists in dissolving 100 grams of crude rubber in 300 of melted naphthalin at the lowest practicable temperature, then adding to the solution 400 grams of Chinese wood oil and 700 of some resin or resinous substance as pitch, asphalt, or the like. The naphthalin must then be driven off by steam heat, which effects the vulcanization of the mass.

Or one kilogram of the material produced by following the directions in the first patent mentioned is dissolved in 3 kilograms of naphthalin, and then 100 grams of caoutchouc dissolved in 300 of naphthalin are added. The latter being driven off by distilling with steam heat, the mass is ready for use.

A PARACHUTE FOR THE AEROPLANE.

Obviously the drawback to all aeroplanes is the great possibility of coming too suddenly to earth. A number of parachutes have been invented for the personal use of the airman, the purpose being that if anything happens to the aeroplane he can cut loose from it, letting it take its own course, while he, buoyed by his parachute, drifts down quietly and safely to earth. But a more comprehensive parachute has recently been devised which aims to keep up the entire machine. It is folded away in a little box over the flyer's head and has ropes attached to all corners of the frame. If anything happens to the machine the pilot releases the parachute, which opens up above and brings pilot and aeroplane both gently to earth. At least this is the theory.

Some Neglected Near-by Markets—IV.

SALVADOR.

THE average American who is able to remember the names of all the Central American Republics feels a distinct pride in his accomplishment and naively refers to the excellence of the memory which has preserved this knowledge since his grammar school days. They are, in his estimation, spots on the map, representing insignificant and ill-defined regions outside of all civilized travel, steaming with tropic heat, inhabited mostly by savages, mosquitoes and boa-constrictors; the chief industry, revolutions, and the chief product, miasmatic fevers. This ignorance is not far from the level of that found in a few remote corners of New England, where they believe that all the people west of the Mississippi are a rude, ungodly lot who carry revolvers and express their emotions in broadsides of profanity.

But the man who is proudly able to reel off the names of the five republics—or six, if we count Panama—will decline to locate them unless he has a map at hand. When he looks at the map he fixes their relative importance or unimportance by the space which they occupy and, accordingly, gives Salvador a very low place. It is true that, on a map of North America, Salvador does not make a very big showing, but there are considerations other than geographical extent. The country having the least area of all the counties in the United States is New York County, New York, which is not a negligible quantity in the affairs of the nation. Salvador has a population as great as that of the State of Kansas, though its area is less than that of any American State except Delaware, Connecticut and Rhode Island. This is a point well worth the exporter's attention. A sparsely settled territory may have a great future, but a thickly settled country has an indubitable present. And there is no need to argue the elementary proposition that in a densely settled community the problems of transportation and distribution are reduced to a minimum. Salvador has a population of about 250 to the square mile, a density nearly ten times as great as that of the United States. This is made more impressive when we reflect that a like density would give our average American townships of thirty-six square miles a population of no less than nine thousand. The population of Salvador, moreover, is industrious, thrifty and peaceable. About half of it is of Indian blood, while the remainder is chiefly of mixed European and Indian extraction. A minority of pure whites exists, forming a sort of natural aristocracy of wealth and education, but separated by no hard and fast lines from the cultured element among those of mixed race. The negro element is small, chiefly foreign and confined to the sea-coast towns.

Are the Indians civilized? They are, and have been since long before the coming of the white man. They belong to the Tlascaltecan branch of the Aztec family, who submitted to their Spanish conquerors exactly as our own Saxon ancestors submitted to the Normans, and the reproach is no greater in one case than in the other. Peaceable, unarmed, unorganized farmers, they were no match for trained soldiers equipped with the best weapons the times afforded and urged on by greed of gold and power. But the Indian, as did the Saxon, has stayed and multiplied and it is no longer a reproach to belong to the conquered race.

If we imagine the population of Kansas settled on 10 of the 105 counties of that State, we would see that it was well worthy the attention of our manufacturers. And when we realize that Salvador is little further from New York than Kansas itself, it is really time for our business men to sit up and take notice. Only a thrifty and industrious people can

exist in such numbers on so small a territory, and such a people are always good customers. The farms of Salvador are really a series of gardens, interspersed with villages and towns. The soil in many districts is fourteen feet deep and everywhere of amazing fertility. In fact, this very fertility is the chief difficulty with which the tiller of the soil has to contend. The weeds spring up behind him in the row he has sown. A few weeks of fallow turns his garden into a miniature jungle. But, as may be imagined, no slothful and slipshod methods are followed in a country which supports 250 to the square mile more than one person to every three acres—and exports millions of dollars' worth of agricultural products. Within the limits of this little republic is grown every garden product of the tropic and temperate zones. The hot coastal belt is but little more than ten miles wide, the remainder of the country being salubrious uplands, with forest-covered mountains intersected with fertile and cultivated valleys.

The far-famed Balsam of Peru is a product of Salvador and nowhere else. Its misnomer dates back to the time when Spanish America was either "Mexico" or "Peru" and



—Pan American Union.

A BALSAM TREE IN A FOREST IN SALVADOR.

everything coming by way of Panama was considered Peruvian. It is the product of a leguminous tree known as *Myrospermum peruviae*, but which the botanists of the region very reasonably ask to have called *Myrospermum salvadorensis*. It would seem, however, that the generic synonym, *Myrospermum*, is preferable, in view of the manner in which the characteristic product is obtained. It is a lofty tree, frequently reaching a hundred feet in height, with the characteristic

leaves of its tribe and a yellow, one-seeded pod. This balsam is secured by incision of the bark in much the manner that rubber is obtained. It will flow at any time, but the best results are had in the dry season, which coincides with the inclination of the "balsameros," who find occupation in other industries when the rains are coming down. This balsam is a fragrant oleo-resin, having medicinal virtues recognized today as well as centuries ago. The tree begins to yield a product of value when about twenty-five years old and with proper care will continue to yield for fifty to seventy years. The wood is valuable for furniture, being similar in color and quality to rosewood, which belongs to the same family.

The great staple of Salvador is coffee, of which, in round figures, eight million dollars' worth annually is produced for export. This is about one-twenty-fifth as much as the coffee exports of mighty Brazil, with a territory nearly five hundred times as great. In the production of gold Salvador, area for area, exceeds any other country on the face of the earth. Its commerce, with ten million dollars of exports and more than six millions of imports, has increased about 50 per cent. within four years past. Something more than a third of its imports come from the United States, chiefly cheap cotton cloths, flour, machinery and the coarser forms of hardware—all staples which sell themselves and give only moderate profit, leaving the cream of the trade and profits to European merchants, who have twice as far to carry their goods, which often cost more to produce than do the American.

In this busy, energetic little state American rubber manufacturers can find a ready market for several lines of goods. Belting and other lines of mechanical goods are called for in constantly increasing quantities, as the native manufacturing industries are passing rapidly from the household to the factory stage; every village is planning for electric light and power; the mines of gold, silver and other minerals are steadily increasing their output, and scientific equipment and the plantations are using machinery more and more with each passing year. When we remember that the farms of Salvador are really gardens and that the only weather contingency which the gardener dreads is that of drought, it ought to be the business and pleasure of one or several American manufacturers to teach the Salvadoreans the uses and virtues of garden hose. The streams are there in abundance and the dams and reservoirs will not be long lacking when the cultivators of the soil realize that they can remove the last chance of failure in producing their crops. The numerous cities and villages, with their large proportion of wealthy and cultured people, offer a market for druggists' sundries which will compare favorably with many portions of the United States. Rubber shoes, of course, are not greatly in demand in this or any other hot country, but there are still a few everywhere who will endure the heat for a time in order to go dry-shod during the season of tropic rains. Road building on a scientific basis has made a beginning and the density of population makes feasible what could hardly be undertaken in a more sparsely settled country. Automobile roads now connect some of the principal towns away from the railroad and in a very few years it will be possible to motor from one end of the republic to the other. And the rich crook who breaks the speed laws will be followed by a Mestizo policeman on a motorcycle, and Indians on bicycles will scorch after them to see the fun. Somebody is going to finish the tires, and why not the American?

The salesman who goes after this trade must speak the Spanish language, though a foreign accent will do him no harm if he is intelligent and polite, regretful that he cannot speak the pure Castilian of his customer and profoundly grateful for the courtesy which overlooks his failing. And he must not be too impatient of "manana." If the customer says "manana," manana let it be. Better an order tomorrow,

or even the next day, than no order to the end of time. There are two sides to the question of sauntering or galloping through life and, as Sancho Panza would put it, a bird in the hand is worth two in the bush, and when you are in Rome you should do as the Romans do. Trade is conducted on the basis of the buyer's wants, in matter, in manner and in time; and it is distinctly preferable that the merchant should say "Manana" than "Adios, Señor!"

Postal and telegraph facilities are excellent and the telephone service is very complete, it being possible to telephone from one end of the country to the other. Banking facilities are all that could be desired. Hotels are good and prices very moderate.

The best way to reach Salvador is by way of Panama, passing thence by boat to the port of Acajutla, whence a railway of sixty-five miles' length leads to the capital, San Salvador. Here, at the traveler's leisure, he can plan his trip through this land of picturesque scenery and lovely gardens. If he has understanding, sympathy and philosophy he will vastly enjoy his experience; and if he has tact and business sense he will add to the worldly prosperity of himself and his employer.

The principal ports other than Acajutla are La Libertad and El Triunfo, on the Pacific Coast, and La Union, at the head of the bay at the eastern end of the republic. Acajutla, though itself an insignificant village, being the terminus of the railway system leading to most of the important towns, handles nearly half of Salvador's foreign commerce. San Salvador, the capital, has a population of 60,000, with pleasant suburbs in addition. Santa Ana, twenty-five miles away by rail, has 53,000; other places of importance are San Miguel, 25,000; San Vicente, 20,000; Santa Tecla, 18,000; Sonsonate, 17,000; Chanameca, 12,000, and Coatepeque, 12,000.

In 1912 the aggregate imports of Salvador equaled \$6,774,859, of which about one-third came from the United States. The total included the following amounts from three principal sources: United States, \$2,627,700.22; United Kingdom, \$1,904,546.16; and Germany, \$664,674.45.

Rubber goods from this country formed the relatively small proportions of \$30,413 in 1912 and \$27,312 in 1913. Belting, packing and hose represented in the earlier year \$8,214 and in the later period \$13,169. Rubber goods not specially enumerated were respectively \$21,643 and \$12,422. Smaller amounts of rubber boots and tires made up the amount.

Our total exports to Salvador for the two years 1912 and 1913 amounted respectively to \$2,421,284 and \$2,389,971.

The rates on rubber goods via the Panama line from the loading piers New York to La Libertad and Acajutla are (including mackintoshes and raincoats) 53 cents per cubic foot, or 95 cents per 100 pounds, at ship's option of weight or measurement.

The total exports of Salvador in 1912 were \$8,936,795, of which the United States took about one-sixth, or \$1,519,154. Under this head were included 25,493 pounds of rubber in 1912, valued at \$19,684; the amount for 1913 being 12,753 pounds, value \$7,433.

On July 18, 1914, the government of Salvador fixed the export duty on rubber at 0.02 peso silver per kilo (\$0.38 per 100 lbs.); this being the rate for the year 1915 or until further notice. The freight rate from Acajutla and La Libertad on crude rubber to New York is \$1.25 per 100 pounds, via the Panama Railroad Co.'s steamers.

The Consul General of the United States is Henry F. Tennant, at the capital, San Salvador. The Consul General of Salvador in the United States is Señor Encarnacion Mejia, who is stationed at San Francisco, which, hitherto, has had most of the trade of our country with Salvador. The Consul at New York is Señor José Alfaro Morán, 42 Broadway; and at New Orleans, Señor Antonio Peralta.

The Editor's Book Table.

THE VALUATION OF RUBBER ESTATES. BY L. C. PECK, Director of the Merger Rubber Estates, Limited, 1914. (Singapore: Kelley & Walsh, Limited; London: Lithingham Wilson. [Cloth, 8vo., 181 pp., 12s. net].)

THE growth of the rubber plantation industry and of the ever-increasing inclusiveness of books on rubber topics are both shown by the title of this volume.

At the time THE INDIA RUBBER WORLD was started there was practically no rubber literature, while a book "On the Valuation of Rubber Estates," if written at that time, would have read very much like the celebrated chapter on the snakes of Iceland. Yet with the passage of a few years comes a time when it is assumed that enough men are able to purchase rubber estates and desirous of so doing, to make profitable the issue of a moderate-priced book dealing with the subject expressed by the title of the work under consideration. Mr. Peck says that the usual method of valuation is to figure a certain assumed production and price, then assume the annual expenditures, deduct the latter, then decide from this income what the estate is worth. It is a result easily attained and, in the author's opinion, it is like most things easily gained not worth much after you have it.

The assumptions made in the work are based upon Malayan experience, but, in the opinion of the author, are generally applicable to plantations of the eastern world, one variation being offset by another in a different direction. An interesting statement of his elucidation of this point is that, owing to the direct buying of Americans, the price realized by the planter is usually better at Singapore than at London.

Mr. Peck assumes that in any well-managed enterprise the entire capital necessary to the bearing stage will be met by annual calls, as needed. He assumes that all the rubber now planted, together with that soon to be planted, will not be sufficient to meet the world's demand for rubber at fair prices. He considers ten per cent. as a reasonable return for future years, with twelve per cent. as the present normal basis. He thinks that investors, who feel that their perfectly safe investments should yield the twenty per cent. realized by the venturesome pioneer, are not altogether reasonable in their expectations.

Turning the author's pounds sterling into American dollars, at the inexact but convenient ratio of one to five, he places, as follows, the normal cost of bringing rubber into bearing: \$35 an acre for the first year after planting, \$25 for the second, \$15 for the third, \$15 for the fourth and \$10 thereafter each year until tapping has begun. This represents planting on cleared land. The cost of clearing represents an expenditure of \$25 to \$50 an acre. Other costs of planting he puts at about \$15. The average he places at about \$45, making the total expenditures up to the beginning of the fifth year an average of \$145 an acre. The capital required for tools, machinery, etc., after tapping has begun, Mr. Peck figures at \$15 an acre.

In the fifth year the planter ought to get a hundred pounds of rubber from each acre of healthy trees, and this ought to go on increasing. There is a wide variety of estimates as to what eventual yield may be expected, from a minimum of 300 to a maximum of 800 pounds. The author thinks that 500 is a safe estimate for the maximum yield in the ninth year and thereafter. The cost of production and sale of mature rubber he places at 9d, or eighteen cents, a pound. Referring to the low yields of young trees, he believes that at present prices tapping will not pay, and that it would better be deferred until a better yield could be expected.

As to the future price of rubber, the author, writing in January, 1914, predicts a moderate rise with considerable fluctua-

tions during the present year, with a gradual drop thereafter. He thinks that 1916 will see an output of plantation rubber alone which will exceed the total supply of every description for 1913, and he believes that reclaimed rubber and the inferior grades of wild rubber will soon be practically out of the market. He believes that the average quality of plantation rubber will be better in succeeding years, owing to the larger proportion which will be derived from mature trees. This brings before us the prospect of a vast supply of uniformly high quality rubber at a price low in comparison with figures of the recent past.

Mr. Peck believes that the eventual normal price of rubber in the Singapore markets will be a shilling a pound, this allowing for fair wages, reasonable contingencies and a planter's profit of ten per cent. on invested capital. He thinks, however, that lower-priced rubber will so stimulate consumption that this normal price, otherwise due in 1921, will not actually be realized for some years later. The reasons for all his conclusions are worked out with great clearness and detail and the work is of interest throughout.

NETHERLAND GUIANA, SOUTH AMERICA--ITS DEVELOPMENT, Resources and Possibilities. By James L. O'Connor, Paramaribo. [Cloth, 8vo, 60 pages with 13 illustrations.]

IN this comprehensive handbook Mr. O'Connor has grouped a quantity of interesting matter affecting Netherland Guiana.

The principal geographical features of the Guianas are as follows:

	Area.	Population.
British	90,277 sq. miles	304,089
Netherland	57,900 " "	100,000
French	30,500 " "	40,000

Netherland Guiana (also called Dutch Guiana or Surinam) lies between British and French Guiana, with an area about that of the State of Mississippi. It is bounded on the south by Brazil and on the north by the Atlantic Ocean.

For the information of the visitors to the recent London exhibition, the booklet recalls the fact that on two occasions in its history Netherland Guiana was under English rule (1799-1802 and 1804-1815), having since the latter date been subject to Holland. Paramaribo, the capital, is situated about 18 miles from the mouth of the Surinam River. It has about 40,000 inhabitants, among whom nearly every nationality is represented.

In the shade the temperature seldom falls lower than 72° F., while it does not frequently rise above 88° F. The good health enjoyed by the Europeans and Americans who have for years made Netherland Guiana their home, bears witness to the salubrity of the climate. The average rainfall is 92 inches per year. While there is rain on about two-thirds of the days in the year, there is never a day on which the sun does not put in an appearance.

Among the chief physical features of the country is the network of waterways formed by some eight rivers, navigable for a certain distance to ocean-going steamers.

With luxuriant vegetation, indigenous trees and plants abound in profusion in the vast forests—which are full of wild animals and birds—while giant palms fringe the river banks.

Previous to the disturbance caused by the war, regular steamship communication was kept up by various companies with Europe and America, and a fleet of government steamers navigated the rivers of the country. The government railway, starting at Paramaribo, traverses the center of the colony for 120 miles, reaching half way to the Brazilian frontier.

AGRICULTURE

So rich and varied is the soil of Netherland Guiana that there is practically no tropical product which is not grown within its borders. Principal amongst them are sugar, cocoa, coffee, bananas, rice, cocoanuts, rubber and balata.

The production of sugar has been relatively stationary, having only increased from 10,931 tons in 1909 to 11,652 tons in 1913. Profits are, however, satisfactory, though plantations are small. Cocoa has been exported from Netherland Guiana for nearly 200 years, the area laid out representing 1862, 1,331 acres, 1873, 4,723 acres; 1913, 14,000 acres. Liberian coffee has since 1880 formed an important feature of the Netherland Guiana coffee industry. During the last six years it has been largely planted as a supplementary culture to rubber. In 1913 about 3,500 acres were bearing coffee, with a further area of nearly 4,000 acres in preparation for planting. The total exports of coffee to the United States and Europe were: 1910, 352,980 pounds; 1911, 431,790 pounds; 1912, 275,667 pounds; 1913, 455,504 pounds. Large profits are being made and are expected to continue.

Mr. O'Connor states that the "Surinam Congo" banana is of better flavor than the varieties from Jamaica and Central America. It excels, moreover, in carrying qualities and in withstanding a sea voyage. In 1913, the United States consumed 54,000,000 bunches, while English imports rose by more than 100 per cent. in the years 1903 to 1913, reaching in the latter year a total of 7,530,000 bunches.

RUBBER.

After unsuccessful results with seeds obtained from Pará in 1896 and 1901, an importation in 1905 from Henaratgoda (Ceylon) of 20,000 seeds produced 9,500 seedlings. The latter were planted out on clay soil and form the oldest regular planting in the colony. Another importation from Pará was made

obtained from the sub-culture of coffee and cocoa for some years. On plantation "Jagtlust" there is now a very good cocoa producing area together with ten-year-old *Hevea* trees. In annexed illustration rubber is shown interplanted with bananas. The following estimate is made of production per acre according to age of trees: 7 years, 110 pounds; 8 years, 150 pounds; 9 years, 210 pounds; 10 years, 250 pounds; 11 years, 280 pounds. At plantation "Voorburg" there are now 6,000 trees being tapped. This plantation has the largest area for *Hevea* under cultivation, and is about to instal machinery for preparing the rubber.

While no considerable quantity of rubber has as yet been exported from Netherland Guiana, the figure has grown from 2,200 pounds in 1911 to 8,900 pounds in 1913; and the author expresses the opinion that with the large areas planted in the last few years *Hevea* rubber will soon become an important article of export.

BALATA.

A comparison is made of the Berbice and Venezuela systems of tapping, the latter method resulting in a larger production at one time, while by the former the trees are spared for a second tapping. It is proposed to fell trees having a diameter exceeding 15 inches and to tap the thinner ones with a taphook.

The following were the balata exports of Netherland Guiana, in tons: 1907, 342; 1908, 447; 1909, 618; 1910, 878; 1911, 1,027; 1912, 723; 1913, 1,186. About 10,000 men are employed in the balata industry, which is one of the most important in the colony.

To those not familiar with Netherland Guiana, Mr. O'Connor's handbook will prove most valuable, while to those wishing to renew their acquaintance with the subject, it will no doubt be of interest.

NEW TRADE PUBLICATIONS.

FOR a number of years after the United States Rubber Co. began to make a line of tennis shoes its annual price lists were modest affairs, simply showing illustrations of the shoes and giving in addition a brief description of each brand and the sizes in which it was made and the prices at which it was sold. But the tennis list issued this year is much more ambitious. It is a small book of 24 pages, printed in three colors on heavy paper, and describes and illustrates 17 different brands. In addition to the old familiar names Champion, Yachting, Gymnasium, Bathing and Vacation, there are a number of new brands, such as Palmetto, Quarter Deck, Regatta, Week End, Colonial, Parade and Veranda.

Each page has illustrative scenes in colors apropos of the shoe described, and as the general atmosphere of sporting shoes lends itself admirably to decorative effects the general appearance of this price list is exceptionally attractive.

"Safety Always" is the title of a 36-page booklet issued by the Miller Rubber Co., of Akron, Ohio—being a comprehensive digest of facts that drivers should know. In this booklet the traffic ordinances, state and municipal, of New York, Pennsylvania, Ohio, Indiana, Michigan and Illinois are given, with directions for signaling and illustrated explanation of police traffic signals. Four pages are given to the merits of Miller products and the methods adopted in the manufacture of the Miller tire, etc. Road rules, both common-sense and otherwise—the latter known as the "Fools' Twelve Commandments"—are given a place in the booklet, which concludes with a list of the company's distributing branches and agencies, of which there are 36 in as many cities in different parts of the country.

The September calendar in the monthly series being distributed by the Derby Rubber Co., manufacturers of reclaimed rubber, of Derby, Connecticut, suggests in its decorative as well as in its calendar features the approach of the fall season. The upper



RUBBER INTERPLANTED WITH BANANAS.

the same year. Since then seeds have been regularly imported both by individuals and through the Agricultural Department.

The greater care and expense involved in the cultivation of *Hevea*, it is remarked, is usually compensated by the sub-cultures. In Netherland Guiana *Hevea* is practically always planted with bananas, this system having a very good influence upon the plants. The young trees are protected from sun and wind, while the soil is less affected by sunshine and rain. Another advantage is that with bananas a profit is obtainable after a year, while if planted alone the trees would be unprofitable for three or four years, if not longer. In addition to bananas, coffee or cocoa is generally interplanted with the rubber.

Bananas, if planted without any other sub-culture, can be kept for 2 or 3 years after which a profit can still be

part of the panel, over the business card of the company, contains a picture entitled "A Clean Double," showing a flight of wild ducks, two of which are making rapid descent, brought down by the rifle of the sportsman concealed on the edge of the lake.

A new wall hanger or window card, for garages and retail distributors of automobile accessories, and sufficiently striking in color effect to attract attention whether one happens to be in the market for such supplies or not, has just been sent out by the Firestone Tire & Rubber Co., of Akron. This hanger is 15 x 28 inches in size, printed in blue and orange on a white background, and calls attention in effective manner to the numerous tire patches and other accessories that form a part of the stock of the tire dealer. The hanger is arranged for mailing and can be folded for this purpose.

The National Association of Waste Material Dealers is issuing through its office at 170 Summer street, Boston, an Association Bulletin, the first number of which appeared on August 31, and later numbers of which will appear from time to time as matters of importance to members arise. This first number contains four pages, all filled with items of interest to waste material dealers generally, including a list of members—of whom there are now 88—of officers and committees, notices of meetings, standards of packing and a brief history of the association, which was formed March 24, 1913.

RUBBER RELIEVING LEATHER SCARCITY.

THERE is an old saying that "there's no great loss without some small gain." The present uncertainty regarding some lines of rubber manufacture, which, because of the unsettled conditions of business brought about by the European cataclysm, is pointing to a decreased demand for rubber, can certainly be partly balanced by the wonderful increase in the use of this material in the shoe industry.

Never but once before in the history of this industry has leather been so high priced as it is today. Once, along about the close of the Civil War, quotations were higher, but even then the prices were on a currency basis, with gold at a heavy premium. With the state of affairs at present confronting shoe manufacturers, it is a happy coincidence that the summer season just closed gave the stamp of approval to footwear in which other materials were used in place of leather, both in the uppers and in the soles.

The rubber footwear manufacturers have been making what are collectively known as "tennis goods" for many years. These were mainly cloth-topped shoes with thin cemented rubber soles. As outing shoes of the cheaper kind, and for yachting, outdoor sports, and for gymnasium use, these lines have had a steadily increasing demand.

Moreover, the public has been educated up to the value of rubber heels as shock absorbers and as means of securing noiselessness in offices and hospital.

Then the tango craze set in, and people discovered that the light rubber-soled tennis shoes made firm, non-skid footwear for indulging in this somewhat gymnastic style of dancing, and shoes which until then were looked upon as suited only to the piazzas or the beaches invaded the ball-rooms at the summer resorts, and later the fashionable city *soirées dansantes*. Then the tennis shoe manufacturers made dancing pumps with rubber soles, and sold them like hot cakes.

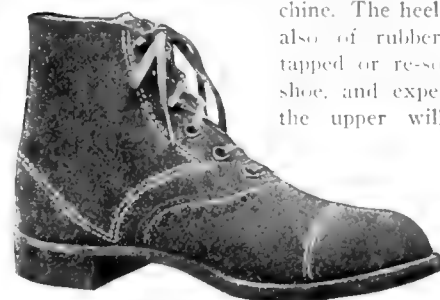
These are probably the main factors which led to the evolution of the stitched rubber-soled canvas shoe and the rubber-soled leather shoe, both of which, though formerly known and sold in a small way, never achieved a real vogue until last summer. During that season hundreds of thousands of rubber-soled shoes of stylish appearance and fine workmanship were sold. They became a fad at seashore and mountain hotels, as well as on the

promenades in all the large cities. Today the prices of all kinds of sole leather are high. Tanners say they must go higher. Shoe manufacturers may therefore hail with delight the growing demand for rubber-soled footwear. That the demand is growing is shown by the number of concerns which are now manufacturing rubber soles. It is a poor month which does not see a new concern starting in this line, while every company which previously made rubber heels has branched out in the manufacture of soles.

Naturally, there are various qualities of soles manufactured. The agent of a leading concern in this line stated to the writer that he could—and did—furnish rubber soles for as high a price as three dollars, and as low as thirty cents, a pair. It might have been these thirty cent soles which disgusted some shoe manufacturers, who had their shoes returned with the soles cracked through straight across the ball.

Of course every popular thing, if it is at all expensive, is imitated sooner or later in cheap quality. Rubber soles were no exception, but manufacturers have learned that rubber soles must contain rubber, and are buying soles which will not break in the machine sewing, and which will wear at least reasonably well under ordinary conditions.

One of the leading rubber footwear manufacturers seeing the trend of leather shoe prices, and foreseeing the probable inability of shoe manufacturers to produce a durable work shoe at a reasonable price, has added a line of footwear which is commanding a fast increasing trade. It has an upper of specially made duck of long staple cotton, a full slip-sole of rubber stitched to the upper, and a rubber sole stitched on by the Goodyear machine.



WORK SHOE WITH RUBBER SOLE AND HEEL.

The heel, of the usual height, is also of rubber. This shoe can be tapped or re-soled just like a leather shoe, and experience has shown that the upper will outwear two soles.

But it is not on work shoes that the use of rubber soles predominates. Quite the contrary. Today there are shoes of the best leathers and the finest workmanship with rubber soles and heels. Both men's and women's styles are thus made. There are ball-room pumps, promenade shoes, and business footwear not only for summer use, but for heavy winter wear. One objection raised against rubber soles is their weight. A thick sole of rubber is heavy, even though no more cumbersome than a similar thickness of leather sole. But with the better quality of rubber now demanded, the soles are made considerably thinner, while at the same time, because of the very nature of real rubber, they wear longer than the thicker leather sole. In fact a prominent manufacturer of these soles and heels states that in the impact of the foot on the pavement, rubber rebounds where leather scrapes along, and this fact accounts for the longer life of the former.

Another objection sometimes cited against rubber soles is their imperviousness. This is a distinct advantage in keeping outside moisture from the foot, but the opposite as inducing perspiration. This, however, is readily overcome by the use of leather insoles of good quality. Then again there is the tendency of rubber soles to slip on wet surfaces. To overcome this has been the subject of earnest experiment and study, and today, besides the various grades of more or less "pure" rubber soles, shoe manufacturers are offered, and are now using on their samples for next season, soles compounded of rubber vulcanized with a large proportion of disintegrated leather fibre, which, it is claimed, insure against slipping on wet pavements, and which are said to wear longer than either rubber or leather.

soles. Experiments have also been made by adding cotton fibre to rubber for soles and heels; and even "steel wool" is being used in some lines of rubber for giving added durability to the rubber.

Parenthetically, it may be said that for several years a prominent dealer in shoemakers' supplies has had a steady trade in soles and taps for repairing heavy shoes, to which he gives a fanciful name. It is really second-hand rubber belting died out in the shapes of soles, heels and taps. Every reader of this journal knows the quality of rubber and cotton duck used in making belting. These soles wear three or four times as long as leather of the best quality. While they show their layer construction at the edges, and no easy way has been found of



SUEDE OXFORD WITH WELL-SEWED RUBBER SOLE AND WEDGE HEEL.

"finishing" these edges, yet the soles are popular with motor men, teamsters and workmen, who demand wear, regardless of appearances. Why would not some experimentation along this line be profitable to the factories making similar lines of goods?

The spring and summer samples of shoes are now in the hands of salesmen on the road. Many manufacturers have directed their salesmen to keep in constant touch with their home offices, for with the present uncertainty of leather supply and leather prices, the cost and therefore the selling prices of all leather shoes are likely to be advanced any day. With rubber-soled shoes it is different. Manufacturers know, approximately at least, what the material will cost; so they can today set the prices for the entire season.

Manufacturers of men's and women's shoes in the fine and medium qualities state that they expect a heavy demand for rubber-soled shoes for next summer's wear. Of course opinions differ as to proportions, some believing that the call will reach as high as twenty-five per cent., while others, more conservative, place it at ten or fifteen per cent. If it only reaches the latter figure, that ought to be nearly forty million pairs of soles, sufficient to keep several factories busy for the next six months and absorb a considerable volume of rubber and compounding materials.

NATIONAL ASSOCIATION OF COTTON MANUFACTURERS AND THE FINANCING OF THE NEW CROP.

A report has been issued by the above association upon the recent Washington conference of those interested in the production, marketing, financing and manufacturing of cotton, attended by some 250 representatives of the cotton industry in its various branches. The conference was held on the invitation of the Secretary of the Treasury, Hon. William G. McAdoo, who stated that under the present law the banks could get all the currency necessary to take care of the situation. He considered that valorization was a wild and ridiculous experiment. It was his purpose to accept from the banks of the currency associations notes and obligations secured by properly issued and certificated cotton warehouse receipts. The banks, he considered, were the proper agencies to make the loans and to trace out the location of every bale of cotton behind the notes which were made the basis of this currency. He added that what was required was to get the cotton warehouses into shape.

In reporting to the members the result of the conference (in which he had participated) Mr. Albert Greene Duncan, the president of the association, has expressed the hope that support and encouragement would be given Secretary McAdoo on his constructive and conservative stand on the subjects dealt with.

THE COTTON SITUATION.

SOUTHERN spot cotton is receiving a good deal of attention at this time from the fact that the United States production for 1914 will approximate 15,000,000 bales. Under ordinary conditions 5,000,000 bales of this amount would be shipped to Europe and the remaining surplus production of our Southern cotton fields taken care of without further complication. The European war, however, created a condition that required prompt and effective measures to save the Southern cotton situation.

Prompt and effective measures were taken, and the assistance which the Federal Government extended to the cotton growers by the issue of National Bank currency, through designated banks, against notes secured by cotton warehouse receipts, has already greatly improved the situation. The result will undoubtedly be that the bulk of our cotton crop will be warehoused until the close of the war or until the spot price warrants selling. The fact that warehouse receipts are negotiable has resulted in a tendency on the part of the producers to hold their cotton. The cotton farmer is now able to renew his notes and secure further credit and supplies. He therefore views the present price of cotton with considerable indifference, and waits for a better market.

The "Buy-a-Bale-of-Cotton" movement has much to commend it for the enterprise displayed by its promoters, but as a practical business proposition it is open to some criticism. The movement had great advertising possibilities and was quickly taken up by keen advertisers with the object of furthering sales in the Southern markets. Among conservative people, however, the impression exists that a plan which would include the manufacturers of cotton goods in its beneficent scope would be more acceptable to the greater number of those interested in the cotton industry.

As a result of the war the foreign supplies of burlap have been entirely cut off. The estimated consumption in the United States is 700,000,000 yards per year. There is no burlap manufactured in the United States and consequently cotton goods must be used as a substitute. Some mills are now putting up their product in cotton goods in the place of burlap, thus creating a new outlet for cotton fabrics.

The estimated United States production of Sea Island cotton for this year will be 75,000 bales. Last year there was a shortage of 19,000 bales, which was made up from the previous year's crop. This means a shortage for the present year, as there has been no visible increase in the production of this staple. This indicates that the price of tire fabrics will be held firmer on account of the size of the Sea Island crop and the uncertainty of the arrival of Egyptian supplies due to the war.

It is understood that contracts are being placed for hose and belting duck on a basis of 19½ cents per pound, but this price is liable to advance with the price of the raw product.

LOW BIDS ON FIRE HOSE.

Of the bids opened September 11 by the City Commission of Trenton, New Jersey, on the fire department's requirements of 2,000 feet of rubber lined double cotton jacket hose, that made by the Empire Rubber & Tire Co.—62.9 cents—was the lowest. Other Trenton companies which submitted bids were The United & Globe Rubber Manufacturing Co.—68 cents—and the Hamilton Rubber Manufacturing Co.—78.5 cents. These are said to be the lowest bids ever received by the city under present specifications, which are considered very exacting.

GUIDING THE MOTORIST ON HIS WAY.

HAVING a motor car is not all of motoring—it is only one of the requisites. Another requisite is to know how to get to where you want to go.

Of course, in former years it was impossible to tell when you came to the fork of the roads which went where, and it did not always occur that some neighborly person familiar with the ground happened along just at that moment to give the needed information. To be sure, the good road books which began to appear in the old bicycle days and multiplied when the motor came in vogue were a material help, but still the good road books tried to cover so much ground in such little space that they left a great many puzzling corners entirely unattended to. And then, it is a great consumer of time, not to say a most inconvenient process, to take out a map at every cross road and discuss what particular point in the map fits the special place where you happen to be. The sign post that not only points the way but tells the distance is a vast improvement over the road book; and The B. F. Goodrich Co., of Akron, Ohio, if it does not exactly cover the United States with these sign posts, has at least made a very good start towards it, for its sign posts, with their explicit directions, now cover 40,000 miles of American high-ways.

This idea of giving the motorist on the road just the information he needs started in a small way some years ago with the Goodrich company, but it has now developed into an extremely large and very important department.

They now have three truck crews of trained men working in different sections of the country under the direction of their Touring Bureau. The type of sign decided upon after long and careful experimenting is simple, effective and durable. It is circular in shape, is made of porcelain enamel in three colors, with arms pointing to destinations in as many directions as are required. Each arm shows the town name and mileage thereto. The enameled sign is erected on a ten-foot, creosoted post of cedar or oak. Danger signs are placed at railroad crossings and short turns, and every effort is made to assure safety to the tourists. When one considers the extent of the territory covered, the magnitude of the task is appreciated; but little by little they are recording distances in all sections. As stated above, they have already road-marked over 40,000 miles of highway and expect to do many more. Their guide posts have been endorsed by practically all of the State Highway Commissions and several of these bodies have even gone so far as to erect on their own initiative these same Goodrich guide posts along their more traveled roads. Among these are the associations of South Dakota, Wisconsin and Michigan.

To be sure, the basic purpose back of these road guides is to

bring the Goodrich tire to the attention of the motorists. In other words, it is an advertising device. But it is a very welcome



ONE OF THE GOODRICH GUIDE-POSTING CREWS ERECTING A ROAD MARKER.

and effective sort of advertising, because it cannot fail to get the good will of tire purchasers. Nothing is quite such a relief

to the tourist's mind as to find at the crossing of the ways an accurate index finger pointing him just where he wants to go and indicating just how long it will take to get there. Here is a photograph of one of the Goodrich guide-post trucks at work.

Another department of the Goodrich Touring Bureau, and one that is desperately hard worked in summer, is the department



RAYMOND BECK, CHIEF OF THE TOURING BUREAU.



E. C. TIBBETS, GENERAL ADVERTISING MANAGER.

devoted to giving applicants specific information regarding any piece of road in which they may be interested. The Bureau often receives as many as 400 requests in a single day from people who want to know all about a certain piece of road, possibly in Maine, likely enough in Florida, or perhaps over on the Pacific coast. In order to answer all these questions the Bureau is compelled to be familiar with all the roads of importance in the United States; and that is no small job, when one recalls that the mail route roads of the United States alone aggregate over a million miles.

These requests for special information not only come from all over the country, but come from all kinds of people. The Bureau does not inquire even whether they use Goodrich tires. No questions are asked, no charge is made, and all get the information they desire. Here is a photo-reproduction of Mr. Raymond Beck, chief of the Bureau. The other portrait shown above is that of Mr. E. C. Tibbets, who, as the general advertising manager of the Goodrich company, encourages and abets Mr. Beck in the highly valuable and exceedingly humanitarian work of throwing light on dark places and guiding the stranger in the way he should go.

THE RUBBER TRADE IN AKRON.

By Our Regular Correspondent.

THE general rubber trade in Akron is about in the same condition as it was before the European war. Factories are running about the same, several of them having under contract or in their possession a crude rubber supply sufficient for the remaining months of the year. The others feel confident of being able to secure all the crude rubber they need, so that the general tone of business is good. Some of the factories at the beginning of hostilities cut down their working forces, but these have been increased again practically to the previous number.

The mechanical rubber line is strong and active. The tire business is slow, as is generally the condition this time of the year.

* * *

The Firestone Tire & Rubber Co. is working on a new addition. The slowness in general business during the last year and a half has affected very little, if any, the rapid construction and enlargement of the Firestone plant. This is reflected in the yearly report of the company, which was submitted at the annual shareholders' meeting, September 2, at which the old board of directors was re-elected, as follows: H. S. Firestone, R. J. Firestone, Will Christy, Amos Miller (of Chicago), and Dr. Sisler.

The sales for the fiscal year ending July 31 amounted to almost twenty million dollars, on which the net profit was \$2,857,719. The increase in output during the year was 78 per cent. over the previous year's production, which was by far the largest of any year in the company's history.

On October 15 the Firestone company will hold its sales convention, and the active sales force, which consists of between 250 and 300 men, will be in Akron for a week. These conventions form a sales school of the highest type and have proved very beneficial to the company. The work of this force in the field has caused to be added since last October 95,000 square feet of floor space to the Firestone plant.

* * *

The Republic Rubber Co., of Youngstown, Ohio, under the direction of Thomas L. Robinson, and sales manager John H. Kelly has just held its yearly sales meeting at Youngstown.

* * *

The Akron Rubber Mould & Machine Co. is placing on the market an improved vulcanizer for auto. dealers who wish to do their own repairing.

* * *

The Adamson Machine Co. has commenced construction of a \$20,000 addition to its building. It is also installing new machinery in the part of the factory completed about one year ago.

* * *

The Akron branch of The Birmingham Iron Foundry is manufacturing an automatic mixing apron, for which its inventor, Mr. P. E. Welton, claims special merit.

* * *

The Gordon Rubber Co. announces an increased business as the only effect so far experienced as a result of the war.

* * *

W. W. Wildman, general manager of the Portage Rubber Co., says: "The European war has had no effect in the business of the Portage Rubber Co. except in the way of increasing our sales, as since the war has been declared our business has been better than ever before, and we have been compelled to operate our plant overtime.

"We might add that our sales for the first nine months of our twelve months previously, and at the present time we are fully thirty days behind on orders. We are now adding to our power plant by installing a battery of Stirling boilers. This, with addi-

tional equipment that we are putting in, will enable us to largely increase our output."

* * *

The Mohawk Rubber Co. is remodeling a building 61 x 100 feet, and building another 31 x 56 feet.

* * *

Charles E. Wood, crude rubber broker of New York, has opened an office in Akron—at 308 Hamilton Building—of which C. E. Siegfried will have charge.

President B. G. Work, of the B. F. Goodrich Co., and Mrs. Work have returned to their home from Carlsbad after an exciting trip through the European war zone. Their automobile was seized by the German government and the French chauffeur retained by the German troops. After suffering various other inconveniences they arrived at Rotterdam, from which place they sailed for New York.

* * *

The magnificent home of Frank Seiberling is rapidly nearing completion. The immense park, with its natural scenery, which surrounds it, affords a setting which is rarely excelled by a combination of the best of nature and of artistic skill.

THE RUBBER TRADE IN BOSTON.

By Our Regular Correspondent.

THE Boston rubber goods situation is peculiar, though probably no more so than in any other section of the country. A canvass of the different branches of the trade gives one a pretty fair idea of the state of affairs, but in some cases widely divergent ideas as to present conditions and future prospects. I wish I could give you the details of these personal interviews with the names of the persons questioned, but there seems to be a most marked disinclination on the part of many to have their views published with their names attached. They were not backward, however, in expressing their opinions, provided their names were not mentioned.

For instance, an importing house told THE INDIA RUBBER WORLD correspondent that while at first the securing of crude rubber was a difficult matter, the situation is clearing; that considerable rubber en route from the Far East was held up because the ships containing it were flying flags of belligerent nations and had therefore put into neutral ports to prevent capture. There were many such ships in the harbors of the Mediterranean. The carrying trade from South American ports is generally in British or German owned ships and they had discontinued their sailings. Then Brazil declared a long-continued holiday, the banks closed and it was impossible to do business. Later, though rubber was for sale, there was no possibility of exchange. This importer, however, hunted up some one with claims against South American merchants, purchased the accounts for cash, and bought rubber, tendering these accounts as payment, and secured some hundred tons of crude rubber.

Few consumers purchased crude rubber at the high quotations noted a few weeks ago. Of course every manufacturer has a larger or smaller supply on hand, and unless he was seized by the contagion of alarm, he refrained from buying, running the risk of higher prices later. It proved a good gamble.

A manufacturer of mechanicals, when interviewed, said that business is considerably behind that of a year ago, a fact accounted for by the general tendency in all lines to economize, and to the shutting down, or working on short time, of many manufacturing establishments.

Regarding druggists' soft goods, a producer says that while the demand may not be so general, there are some large contracts being offered by the syndicates which run a larger or smaller number of stores. These people are close buyers, but

they give quantity orders, and the factories are kept running along on full time at a moderate profit.

The waterproof clothing men are busy, though with some of them the outlook is not so bright. Their foreign trade is cut off, and with some this is an important part of their business. Then, again, they complain of the difficulty in securing some lines of fabrics which they need. Those using imported cloths are not the only ones affected. Many who have contracted for domestic fabrics find the mills held up because of the embargo on dyes. However, some of the makers of high class garments report a heavier trade on these goods because of the decline in imports of foreign made waterproof coats and cloaks.

The tire men seem to be hit pretty hard. Some factories have curtailed their output. One factory where a small number of tires was made has discontinued this department. Another is working only four days a week, while a larger producing plant is working right along with as large an output as usual.

The rubber boot and shoe factories are running reasonably full. Many retailers who declined to order in the spring and early summer are now stocking up, and this reassures the jobbers to the extent that they are sending in supplementary orders to the manufacturers. The mills made up floor stock during the summer in anticipation of this very condition, and shipments are heavy.

The Boston Boot and Shoe Club is the largest trade dining club in the city. During the fall and winter months six or seven banquets are held at the Hotel Somerset, to which some of the most noted speakers of the country are invited. Once, several years ago, a "Rubber Night" was held, at which many prominent members of the rubber footwear industry were guests. There is a possibility that an evening this season may be devoted to this subject.

* * *

Hon. L. D. Apsley, president of the Apsley Rubber Co., of Hudson, was suddenly called to Lock Haven, Pennsylvania, early last month by the severe illness of his venerable father, who died on September 10. This was a second affliction to Mr. Apsley, whose wife died only a few months ago.

George Apsley was Lock Haven's "grand old man." Up to his ninety-fifth year he walked back and forth every day from his house to his shoe supply and findings store, which he established in 1861. He was born in Chestertown, Maryland, in 1818. His son, L. D. Apsley, made it a duty to spend Thanksgiving every year with his father, and on every such visit a game of checkers with the old man was a regular part of the programme. It is reported that this was the origin of the checker board printed on every case of Apsley rubbers sent from the factory.

* * *

Ira F. Burnham, president and treasurer of the Stoughton Rubber Co., spent his vacation at Whitefield, New Hampshire. He returned to business September 10, reporting very cold weather in the White Mountain region, with the summits of the Presidential range covered with snow.

Washington B. Cook, manager of the Boston store of the Gutta Percha & Rubber Manufacturing Co., had a lively experience early last month. He had been summering, with his family, at Lake Sunapee in New Hampshire. Business requiring his presence in Boston, he decided to spend the night at his home in Sharon. Arriving there at a late hour, he opened the front door with his latch key and was confronted by a burglar, armed with a revolver. Ordered to put up his hands, Mr. Cook, who was certainly surprised, and who was unarmed, obeyed the order, and the thief escaped. Then Mr. Cook got busy at the telephone and a man-hunt was instituted by the police, in which more than 300 citizens took part. An hour or two later one of

the volunteer searchers, tiring of the game, started across lots to his home, when he saw a man enter the bushes on the lawn. Later he saw the man lying in a secluded spot. The telephone brought the police, who found a man soundly sleeping in the bushes with Mr. Cook's revolver in his hands and the Cook family jewels in his pockets. Mr. Cook is congratulating himself that his timely arrival saved for him jewels and silverware of considerable value.

* * *

The Haskell Golf Ball Co.'s suit against the Sporting Goods Sales Co. has been decided in favor of the Haskell company. The United States Circuit Court of Appeals found the complainant's patent valid and that the defendants' ball was an infringement holding that the Haskell ball's core and shell in combination produced a new mode of operation and that the patent is not void, as disclosing no patentable invention.

The C. A. Edgerton Manufacturing Co. of Shirley, has voted "that the name of this corporation be, and the same hereby is, changed to the President Suspender Co." Thus the name of the founder of this important business disappears; but sentiment must give way to modern business expediency. The product of this company is so thoroughly advertised that it has a world wide reputation, and it is certainly advisable that the company should bear a name easily identified with the goods.

THE RUBBER TRADE IN RHODE ISLAND.

By Our Regular Correspondent

EFFECT OF THE WAR ON THE RUBBER INDUSTRY

WHILE much anxiety was expressed among those concerns connected with the manufacture of rubber goods in Rhode Island during the days immediately following the outbreak of the war in Europe because of the fear that hostilities might prevent the procuring of crude material, a much more optimistic sentiment now prevails.

At first a very pessimistic feeling pervaded the local trade and several of the manufacturers in Providence and vicinity made no secret of their fears. Almost immediately a curtailment was begun in production and a cutting off in the time card and number of employees. However, the conditions do not seem to have been so disastrous as was anticipated and there is now a more settled feeling. A majority of the manufacturers now express themselves as confident that the coming winter's business will fully equal, if it does not exceed, that of a year ago.

Most of the factories are now working full time and to nearly full capacity. One plant, which dropped its night shift at the beginning of the European trouble, is still running short time, and the night workers are still idle. Another plant is holding all orders for Europe for the present, but is shipping some goods to other countries, especially to South America.

The makers of rubber boots and shoes are finding a fairly good business and most of these plants are being operated to their full capacity. The outlook is regarded as being very good with the price of crude rubber working downward.

Col. Samuel P. Colt, of Bristol, president of the United States Rubber Co., who arrived home early in September from Liverpool, was in Paris when war was declared. He had been in Europe for some time previous to the outbreak and had naturally given considerable attention to the interests of his corporation and to the rubber situation generally.

Concerning the effect of the war upon business Colonel Colt said, in an interview: "In the end the war in Europe is certain to prove of great benefit to the United States and its diversified business interests. We have already secured a great deal of trade that had formerly been closed to us, and we will not only keep it but will materially increase it. Of course, it is only natural to expect that for a time business would suffer, owing to the unusual and unnatural financial strain consequent upon the

terrible war which is mocking half a dozen of the great nations of Europe.

"As for the United States Rubber Co., I cannot speak very definitely at present, as I have only been able to go into its affairs and matters connected therewith cursorily since my arrival, but I am very glad to say that I have found affairs in practically as good condition as when I went abroad, which, of course, is highly satisfactory. Before I went abroad, I made special and specific arrangements for the importation of a ship-load of crude rubber from Singapore, to be delivered in this country for the United States Rubber Co. should the emergency require. It was further arranged, in order to be upon the safe side, that the ship carrying this cargo was to sail under the American flag. At the present time, however, it does not appear to me that it will be necessary to complete the arrangements in the Singapore deal.

"I believe that the war is to be of long duration and that nothing that the world has seen since the fall of Rome can compare with the present war in any particular. It is absolutely necessary, therefore, to be on the alert at all times to take full advantage of all business conditions and situations and to conserve all the forces possible to meet any exigencies. The general conditions, not only in this country but throughout the world, should naturally produce a good season's business, and there is no doubt to my mind that we must certainly reap the benefit, although, of course, we must expect that there will be a greater or less advance in prices all along the line."

The Davol Rubber Co., of this city, is operating its plant to nearly full capacity, about 85 to 90 per cent. of its force being now at work. Orders from Europe are exceedingly scarce at this time, the company not having had any calls direct from Europe in nearly three months. They have, however, been shipping a small amount of goods to China, Japan and South America.

"The principal effect of the European situation upon our business," said an official of the company, "is the high price of colors, talc and antimony, large quantities of which are imported. We have a limited supply of these materials on hand and are investigating domestic sources and have much encouragement that the deficiency may be met through such channels. As large quantities of these materials are necessary in the mixing of the rubber for our productions, we are especially concerned in this direction. Our manufactures include varied lines of rubber goods utilized in druggists', medical and surgical work, and it is only natural to suppose that these departments will be unusually stimulated. This is to be better understood from the fact that much of the surgical rubber supplies aboard the steamer 'Red Cross' was made by the Davol company, but was not shipped from the factory direct to the vessel."

The plant of the Bourn Rubber Co., this city, is being operated to full capacity at this time, and the outlook is reported to be very good. Reports from their agents in all sections of the country indicate that business is certain to be good from now on, if not better than a year ago, from the fact that retailers sold down so close last winter and spring. The wire department is also very busy, having large orders on hand.

The Revere Rubber Co.'s plant on Valley street is furnishing employment for about 75 per cent. of its capacity during the day time, working on a five-day schedule, closing down entirely on Saturdays. At the outbreak of the war it terminated its night shift and has not since resumed it.

The following is a list of all corporations, concerns and individuals connected with the rubber industry in this city that are assessed for \$50,000 or more, together with the valuation placed upon their property by the Board of Tax Assessors, according to the report just filed with the City Treasurer:

American Multiple Fabric Co., \$94,880; Joseph Banigan estate,

\$1,004,380; Joseph Banigan Rubber Co., \$160,100; Augustus O. Bourn, of Bristol, \$113,640; Bourn Rubber Co., \$147,000; Mary C. Banigan, widow of John J. Banigan, \$53,300; Samuel P. Colt, of Bristol, \$210,100; Davol Rubber Co., \$400,000; Glendale Elastic Fabric Co., \$175,400; Brown & Sharpe Manufacturing Co., \$4,074,440; Mechanical Fabric Co., \$389,740; New England Butt Co., \$191,420; Samuel M. Nicholson, \$199,600; Nicholson File Co., \$706,880; Rhode Island Hospital Trust Co., trustee under the will of Joseph Davol, \$450,000; Revere Rubber Co., \$1,443,780; Henry D. Sharpe, \$523,520; Lucian Sharpe, \$319,880; United States Mill Supply Co., \$57,340.

The tax assessors of the towns of Bristol and East Providence have recently filed their annual levies for the year, and the following are among the larger taxpayers. In Bristol, Col. Samuel P. Colt, president of the United States Rubber Co., is the largest individual taxpayer, his tax this year being \$2,852.55 on property valued at \$1,924,860. The Bristol list includes: Augustus O. Bourn, assessed on \$265,000; Sarah F. Bourn, \$140,000; Le Baron B. Colt and wife, \$90,000; Consumers' Rubber Co., \$124,000; National India Rubber Co., \$5,016,000.

The East Providence list includes: American Electrical Works, \$638,500; Eugene R. Phillips, \$22,235; Washburn Wire Co., \$380,516.

* * *

Substantial improvements have been made at the south entrance to the factory of the National India Rubber Co., at Bristol, where a new pavement of block stone has been laid to resist the encroachments of the heavy teaming.

Frank B. Wilson, of the clerical department at the National factory, is to be a candidate for Town Treasurer in Bristol.

* * *

The Killingly Manufacturing Co., at Killingly, Connecticut, operated by the Goodyear Tire & Rubber Co., of Akron, for the manufacture of especially heavy auto tire fabrics, has been installing considerable new machinery purchased in this city, which is expected to increase the output of the plant fully 30 per cent. The plant was first opened about fifteen months ago by the Killingly Cotton Manufacturing Co., but was later taken over by the present occupants, who have removed all the old machinery and replaced it with new and special machines. It is the only plant of its kind in this section of the country.

* * *

The City Council of Woonsocket has voted the money for the work upon the new footbridge across the Blackstone river, from Constitution Hill to Fairmount street, and the work has already been commenced thereon. This bridge will accommodate the hundreds of operatives who are employed in the Woonsocket Rubber Co. and other large mill plants in that section.

The factory of the International Rubber Co., at West Barrington, is being operated at present on the schedule of four days a week.

R. S. Emerson, of this city, has recently become agent of the Consumers' Rubber Co., at Bristol.

John Baker, formerly a department foreman at the factory of the Bourn Rubber Co., this city, and for many years previously department foreman on rubber coats at the National India Rubber Co., died at the City Hospital in this city recently of tuberculosis at the age of 56 years.

THE RUBBER TRADE IN CHICAGO.

By Our Regular Correspondent

THE rubber trade of Chicago is a little quiet, a fact attributable, according to local merchants, to the indirect influence of the war, a certain depression having been created which tends to inspire economies and to diminish expenditures.

Much tiling business is being placed with the rubber firms of

the city at the present time, many of the large office buildings which have been remodeled and erected during the summer having arrived at the finishing stage. These buildings, under present fire protection rules, all require a considerable supply of fire hose.

The Baker-Vawter Co., 22 South Clark street, had an attractive window display this week of the "Rush Rubber Eraser." The feature of the display was a magnetized glass circular motion outfit, in which a miniature clown and a Teddy bear ran a never ending relay race, with the eraser as the article to be passed. The display attracted a great deal of attention.

Rubber goods of all sorts for household use were on display at the National Household Exposition, which was held at the Coliseum here this week. The show was visited by thousands of people. From both financial and advertising standpoints, the exposition was a great success.

The Peoria Belting & Rubber Works—a branch of the Holmes Packing & Supply Co., of Chicago—is temporarily located at 1100 Old Colony Building, Chicago, its offices and sales rooms in Peoria having been completely destroyed by fire on July 27.

The Manufacturers' Rubber & Supply Co. has been incorporated at Chicago by W. E. and W. R. Anderson and N. Johnson, with a capital stock of \$10,000, to manufacture, buy and sell automobile appliances and rubber goods.

The Positive Puncture Plug Sales Co. has been incorporated at Chicago to manufacture and deal in automobile supplies, accessories, etc. The incorporators are: John H. Nowlin, F. C. Corbitt and O. W. Pellage, and the capital stock of the company is \$15,000.

THE RUBBER TRADE IN TRENTON.

By Our Regular Correspondent.

THE war in Europe has had no depressing effect on the rubber trade of Trenton, trade activities going on without apparent interruption of any kind.

The Thermoid Rubber Co., whose developments demanded additional space, has purchased a plot of ground 75 x 1,000 feet in area adjoining its present works. This company manufactures, in addition to various other rubber goods, the "Nassau" tire, which has especially distinguished itself in a number of the recent races. In the Elgin National Trophy race, late in August, the winner, Ralph DePalma, covered the entire 301 miles without a tire change, three of the tires used being the same which he had used in the 301 mile Cobe Trophy race of the preceding day, when an average of 73.6 miles an hour was made, with only one tire change. Nassau tires were also used in the Elgin race by Bob Burnam, who withdrew after 289 miles without a sign of tire trouble—a feat which he describes as "most remarkable for this course."

The Thermoid company has issued and distributed a War Atlas, containing maps of all countries engaged in the present war, with their colonial possessions. This atlas also gives tables showing the strength in numbers of the respective armies and navies, the principal cities in each country and portraits of the ruling monarchs. It is a book 10 x 13 inches, instructive and interesting and likely to be carefully preserved by all who receive copies. The only suggestion of its real purpose—that of keeping the Thermoid name and product before the public—is on the last page, where Safety Brake Lining is illustrated and its merits described.

The Essex Rubber Co. is erecting a new building at its plant

in this city. This building is to be of red brick and concrete, to cost \$100,000 and will cover the north side of a \$125,000.

The Ajax-Grieb Rubber Co., whose fiscal year ended August 31, reports a greater volume of business than ever before in the history of the company—and this in spite of the fact that a drop of 28 per cent. in tire prices in November last had to be made up before any gain could be shown. The Ajax company is optimistic regarding the coming season, the statement that "the supply of Ajax tires never has been equal to the demand" still applying. No advance has so far been announced in the price of this company's tires as a result of the war and none will be made as long as the supply of crude rubber lasts which was bought at prices prevailing before the war.

A novel idea has been successfully followed out by an Ajax dealer in Alabama. Scouts are sent out around the town who note the condition of owners' tires and report to the dealer. He in turn reports to owners whose tires are so worn as to be likely to soon need new casings, and their trade is solicited. This service is said to be in favor with the automobile owners and to be building up a large trade for the dealer.

State receipts from motor vehicles amounted for the first seven months of the year to \$734,573, a gain of \$145,565 over the corresponding period of last year and of \$73,127 over the entire year 1913. In the seven months 63,097 cars and 8,854 motorcycles have been registered and 60,626 drivers' licenses issued.

Howard Zelley, the Newark branch manager of the Empire Rubber & Tire Co., of Trenton, started September 15 for an extended business trip, which will include Buffalo, New York; Cleveland, Ohio, and Detroit, Michigan.

The John A. Roebing Sons' Co., which manufactures rubber covered and other wires, recently contributed to St. Francis' Hospital in this city the sum of \$2,000 towards the purchase of a sterilizing plant. This company has been a benefactor of St. Francis' on numerous occasions in the past, having furnished rooms in the institution and also donated the land required for its growth.

THE RUBBER TRADE ON THE PACIFIC COAST.

By Our Regular Correspondent.

THE Knight Tire & Rubber Co., of Canton, Ohio, which was formerly represented in San Francisco by the Hallway Co., has established a direct factory branch in that city, of which J. A. Fry—who has been connected with the Knight company for some time—is manager.

This company has also established salesrooms at 1710 Broadway, Seattle, Washington—in charge of E. J. Moskowitz—from which the trade of Oregon, Washington, Idaho and British Columbia will be supplied with Knight tires.

E. D. Wilson, formerly connected with the Savage Tire Co., of Los Angeles, has purchased the business of the Webster Supply House, at Twentieth and I streets, Bakersfield, California, the only exclusive automobile supply house in that city, which he will continue along more extensive lines, having put in a new and complete stock and equipment.

The Fisk Rubber Co., of Chicopee Falls, Massachusetts, has established a factory branch at 725 South C street, in Seattle, Washington, intended to supply the trade throughout the southern and western part of the state.

A contract has been made between the Pacific Tire Co., of Seattle, Washington, and the United States Tire Co., calling for

the use of that company's tires on all the motorcycles employed in the department.

* * *

The Universal Tire Co. is purchasing additional equipment for its automobile tire plant at Anaheim, California, the president of the company, H. H. Hallaway, having recently visited the eastern market for this purpose.

* * *

The Davis-Fry Manufacturing Co. is turning out at its plant in Oakland, California, a line of pneumatic tires and tubes for automobiles as well as a solid truck tire, under the brand name "Hercules." The patent rights of this company cover the making of a tread with fabric on edge, a new feature in construction which is said to prevent skidding and to add greatly to the durability of the tire. The fabric is placed at acute angles with the road.

FATIGUE IN MOTOR TRUCK TIRES.

By A. P. Eves.

THE automobile truck as it is known today is the product of less than ten years' thought and endeavor and the whole industry is suffering from want of experience. The tires are the most talked of part of the machine, because they are the subject of more trouble and more expense than all other parts of the machine combined. This condition finds the manufacturer of tires at fault. He has not progressed as fast as the manufacturer of other truck parts. Solid tires for large trucks are made along the same lines and with practically the same chemicals as horse-drawn vehicle tires were compounded from ten years ago. Excessive strains due to high speeds under heavy loads, it seems, have been entirely over-looked in tire construction.

The steel manufacturer was not long in arriving at the conclusion that steel as made when the automobile was in its infancy would not stand the repeated work under heavy loads of the speeding machine. The automobile industry brought forth the need of an anti-fatigue steel. The steel manufacturer produced nickel, chrome-nickel, vanadium and a host of other special steels to meet the demand; and they met it nobly.

Solid tires do not stand the work required of them. Tires that are guaranteed for 8,000 and 10,000 miles on the average in New York and Philadelphia do not run 2,500 miles. To be sure they are adjusted, but there is the delay and inconvenience of the change.

Tire manufacturers after two or three years of observation and some spasmodic experiments, have adopted a schedule of carrying capacities which is now considered standard. This schedule concerns itself altogether with the dimensions of the tire but specifies nothing whatever about the composition of the tire. It does not mention a standard density or include a physical requirement.

A new steel had to be made to stand the strains of the fast going and heavily loaded machine. The automobile made possible the anti fatigue steel. Rubber is much like steel in many respects. In the by-gone days of small carriage tires, if the tire had a good tensile strength, with proper elongation and set, it was considered good. The automobile industry has brought forth the fact, that altho rubber may be up to requirements in tensile strength, elongation, and have the necessary resiliency, when it is subjected to repeated work undergoing vibrations caused by shocks it must possess other qualities to enable it to meet these entirely new conditions. Take a small piece of rubber one inch square and of any convenient length, hold it so that two inches of its length can be stretched an infinite number of times. If the two inches of the exposed surface is stretched to two and a half inches a certain number of times it will break. Now, then take another piece of the same composition and same

dimensions and fasten it so that the exposed two inches are compelled to stretch three inches. It will also break but in much less than half the time. As these strains approach more nearly to the elastic limit, the deterioration is enormously hastened. This fact assumes great importance when it is noted that the deterioration does not take place at the same rate in all compounds.

A one inch section of a good solid tire compound should elongate $5\frac{1}{2}$ to 1. That is, the one inch section should stretch five and one-half times. It should take between 1,500 pounds and 1,600 pounds to produce this elongation, when the test piece will break. One hundred pounds will probably stretch this test bar one-half inch; if this load can be repeated several hundred times the test piece will break, yet it has never at any time had the full load which is at least 1,500 pounds. The rubber has been worn out by the repeated load of 100 pounds, and this is the action that wears out the tires in service and the greater the load the sooner the tires wear out. This action is called the fatigue.

Compression is another factor in the disintegration of the solid tire. If a load of 25 pounds is placed on a square inch of rubber it will yield; if the load is removed the test piece will fly back to its original form. If this action is repeated a great number of times the rubber will disintegrate. This is a quality that should be taken into consideration in the manufacture of the anti-fatigue tire. This is the action a rubber tire gets under load.

Repeated elongation and compression under a standard load should be a great factor in producing the truck tire of the future.

The man that owns the truck is the one that suffers most from bad tires, and he should insist on having good tires, as they are cheaper in the long run. Then he should be careful of them. Overspeeding and overloading would break axles, steering knuckles and springs if it did not wear out the tires, but as tires are made for the protection of the other machine parts they are the first to go.

The automobile industry has brought forth the need of an anti-fatigue tire or a compound as near anti-fatigue as possible. The automobile manufacturer is also partly to blame for the poor showing of the tires today. He does not insist on quality; all he asks is a long mileage guarantee and a low price. Quality is not a consideration, and it is cheaper to make replacements than to give quality, for adjustments are not made at manufacturers' prices.

A RUBBER COMB WITH A HOLLOW BACK.

This "Revelation" hard rubber comb illustrated here cannot be properly classified under new goods, for as a matter of fact it has been on the market for several years and was described quite a long time ago in this publication; but it probably is new



REVELATION HARD RUBBER COMB

to many people, and it certainly is interesting, as it has the appearance of a very heavy comb and yet, its broad, round back being hollow, it is distinctly a light comb. Its size makes it easy to grasp, and its lightness makes it comfortable to use and less liable to break when it falls. (Harburg Rubber Comb Co., 335 Broadway, New York)

Replete with information for rubber manufacturers Mr. Pearson's "Crude Rubber and Compounding Ingredients"

News of the American Rubber Trade.

THE MULCONROY CO. TAKES ON ALL-METAL HOSE.

THE Mulconroy Co., of Philadelphia, has recently taken over the all-metal hose business of the Schoen-Jackson Co., of Pennsylvania, having acquired all its patent rights, stock and machinery, and employing all of its experienced metal hose workmen. The Mulconroy Co., owing to the increased demand for a flexible hose for high pressure steam, oil and gas, decided to add an all-metal hose to its line, and after many tests concluded that the Schoen-Jackson type best met the requirements and consequently took steps to acquire this line.

MODERN HOUSES FOR FACTORY WORKERS.

The American Hard Rubber Co., of New York, recently applied for permits for the erection of a number of two-story brick dwellings at College Point, Long Island. This is but the beginning of what will probably be an important development. This company built houses for its employes more than thirty years ago, on the community plan, but naturally modern conveniences were not very conspicuous in houses built so long ago. It is the company's intention to tear down these old dwellings and erect in their place detached dwellings with all the modern improvements.

A TRADE EXPANSION COMMITTEE.

The firm members of The Rubber Club of America have recently received a communication from the secretary saying that it has been suggested that a central committee of five manufacturers with offices in New York (other than the present members of the Executive Committee) be appointed as a Trade Expansion Committee to consider the problems that come under this general head and to supervise the distribution of information regarding the possibilities of trade in the foreign markets opened by the war; also to act as a War Conservation Committee to deal with any question of finance and commerce that may arise.

HOW TO RECOVER CONFISCATED CARGOES.

In the early part of September the secretary of The Rubber Club sent a letter to all the firm members of the club referring to confiscated cargoes and stating that "the Marshal of the British Prize Court has informed the United States Consul General in London that neutral owners of goods on vessels seized by British ships can obtain possession of their property, when not contraband of war, by applying to the Procurator General, Treasury Chambers, Whitehall, London, England, who will require proof of ownership and particulars as to freight, whether paid or unpaid."

APPEALING TO THE INDIA RUBBER WORLD FOR INFORMATION.

Since the outbreak of the war and the total disarrangement of European markets this publication has received a number of requests from English manufacturers for information relative to American supplies of the particular materials that they employ. One large English manufacturer wants to know where he can get rivets with hard heads and soft shanks. He says he uses over a million a month and would place a fairly large order at a reasonable price.

Another manufacturer also asks where he can get supplies of steel studs for non-skid tires.

Then there comes a request for zinc oxide, the source of the English manufacturers' supply of this chemical being shut off by the war.

A firm of London manufacturers has written asking where it can get supplies of insulating materials, including ebonite, vulcanite and vulcanized fibre.

From Italy comes a request for information as to who in America manufactures thin gutta percha tissue, the purpose in this particular instance being to cut it into narrow ribbons for mending torn papers.

RUBBER COMPANY DIVIDENDS

The Boston Woven Hose & Rubber Co., of Boston, paid on September 15 a regular quarterly dividend of 3 per cent.

The Rubber Goods Manufacturing Co. of New Jersey, paid on September 16 its sixty-second quarterly dividend of 1½ per cent on the preferred stock of the company and a dividend of 2 per cent on common stock.

The Kelly-Springfield Tire Co., of New York, has declared quarterly dividends of 1½ per cent on the 6 per cent preferred stock of the company and of 1½ per cent on the 7 per cent preferred stock—both payable October 1 to stockholders of record on September 15.

The Firestone Tire & Rubber Co., of Akron, has declared a regular quarterly dividend of 1¾ per cent on its preferred stock and a quarterly dividend of 3 per cent, also an extra dividend of 2 per cent on the common stock—payable October 15 to stockholders of record on October 1.

The B. F. Goodrich Co., of Akron, has declared a quarterly dividend of 1¾ per cent on its preferred stock—payable October 1 to stockholders of record on September 18.

The Goodyear Tire & Rubber Co., of Akron, has declared a quarterly dividend of 1¾ per cent on its preferred stock—payable October 1 to stockholders of record on September 19.

The Portage Rubber Co., of Akron, has declared its regular quarterly dividend of 1½ per cent on preferred stock—payable October 1 to stockholders of record on September 20.

The American Chicle Co. has declared a monthly dividend of 1 per cent and an extra dividend of 1 per cent on its common stock—payable October 20; also a regular quarterly dividend of 1½ per cent on its preferred stock—payable October 1 to stockholders of record on September 25.

The Batavia Rubber Co., of Batavia, New York, has declared regular quarterly dividends of 1½ per cent on preferred and 1 per cent on common stock; also an extra dividend of ¾ of 1 per cent on the latter—all payable October 1.

The Apsley Rubber Co., of Hudson, Massachusetts, has declared a semi-annual dividend of 2 per cent on the common stock of the company, payable October 1 to stockholders of record on September 28.

REGISTRATION OF COMMERCIAL DESIGNS.

A new law for the registration of commercial designs was introduced as H. R. 11,321 in January last, and was dealt with by the House Committee on Patents during a series of hearings covering several weeks. The result of the arguments submitted was the introduction on August 4 of a revised bill (H. R. 18,223) by Congressman Oldfield, chairman of the above-named committee.

The National Design Registration League of Philadelphia has been distributing copies of the latest bill which, it believes, will meet with little, if any, opposition if its need is duly impressed upon Congress by the interests concerned.

BIG BALLOON RACE

It is expected that there will be a big balloon race with seven competitors on October 8. The race will start from Pittsfield, Massachusetts. A valuable prize has been offered by Mr. Cortland F. Bishop, and the race will be held under the auspices of the Aero Club of America.

Replete with information for rubber manufacturers, Pearson's "Crude Rubber and Compounding" is a

GENERAL C. EDWARD MURRAY.

Military men are always interesting, and doubly so at the present time, when their achievements occupy so large a part of the world's attention.

General C. Edward Murray, treasurer of the Empire Rubber & Tire Co., of Trenton, New Jersey, and interested in a variety of other rubber enterprises, has been a military man continuously for nearly thirty years, and for the last fifteen years has been Quartermaster General of the State of New Jersey, with



the rank of Brigadier General. General Murray in fact has been extremely active in several different directions—first, as a rubber manufacturer; second, as a leader in New Jersey politics, and third, in his varied but continuous association with the militia of that state.

He was born in Lambertville in 1863, and it was quite natural that after finishing school and business college he should attach himself to the business controlled by his father, J. Howard Murray, who was a manufacturer of reclaimed rubber. This interesting event occurred in 1883, when Mr. Murray was rounding out his twentieth year, the firm name being Murray, Whitehead & Murray. Nine years later he had full charge of the business and not long after organized the Crescent Belting & Packing Co. and the Crescent Insulated Wire & Cable Co. These various companies, however, did not seem sufficient to engross his attention, so in 1902 he bought out the Empire Rubber Co., and four years later organized the Empire Tire Co.; these two companies being consolidated in 1913 and incorporated as the Empire Rubber & Tire Co.

One would imagine that these varied interests would fairly well occupy any one man's time, but, as mentioned above, General Murray became interested in military matters many years ago. He enlisted in the Seventh Regiment of New Jersey when he was twenty-two, and five years later was made paymaster of the regiment, and a few years later given the rank of Captain. In 1899 he was appointed Quartermaster General of the state, a position he has occupied ever since.

His early developed marked abilities as a political leader, and for nearly twenty years was prominent in the higher Republican

circles of his state and frequently represented his district at national Republican conventions. From 1894 to 1904 he was City Clerk of Trenton. When the Progressive party was organized two years ago he became one of its conspicuous figures.

He was married in 1891 to Miss Cornell, daughter of John W. Cornell, of Trenton, and has three children, the two oldest being boys, who have already associated themselves with the Empire Rubber & Tire Co., one—J. Cornell Murray—as vice-president, the other—C. Edward Murray, Jr.—being connected with the manufacturing department.

The secret of General Murray's successful career is not difficult to fathom. In the first place, he has the greatest of all human assets, a magnetic personality. He is well disposed towards the whole world, consequently the whole world is well disposed toward him. Notwithstanding the innumerable demands upon his time, he is never too busy to see a friend or listen to a stranger. Added to this the possession of an inexhaustible energy, which enabled him to take up each task with enthusiasm; to build up to their present importance the various rubber enterprises which are under his control; to give so much service to the military organization of New Jersey, and to continue year after year such a potent factor not only in the civic life of his city but in the best political development of his state.

PERSONAL MENTION.

Theodore Hofeller, president of Theodore Hofeller & Co., dealers in old rubber at Buffalo, New York, who with his wife sailed for Europe on June 16 last with the expectation of returning about the middle of September, arrived at Boston, September 9, on the "Laconia," having left Carlsbad, Austria, soon after war was declared and visiting Munich and Lucerne en route.

W. J. Kreuder, who has succeeded Clark Swinehart as factory manager of the Vulcan Rubber Co. at Erie, Pennsylvania, was formerly superintendent of the Walpole Tire & Rubber Co. plant at Walpole, Massachusetts.

F. C. Millhoff has been promoted from the tire sales management of the Miller Rubber Co., Akron, to the position of general sales manager.

Earl E. Bain, formerly assistant secretary of the Chicago Motor Club, has been appointed manager of the Dayton Rubber Manufacturing Co., of Dayton, Ohio.

R. P. Dowse has withdrawn from the sales force of the Goodyear Tire & Rubber Co. and is now connected with the Kelly-Springfield company's selling department.

J. S. Paul, formerly connected with the Pittsburgh Rubber & Leather Co., of Pittsburgh, Pennsylvania, has joined the sales force of the Voorhees Rubber Manufacturing Co., of Jersey City, New Jersey.

Mr. J. Wrench, sales manager of the Industrial Chemical Co., under whose management the company has materially increased its business in the rubber trade in this country, returned on the Mauretania on September 3, from the English provinces, where he had been visiting friends.

Mr. J. J. Moriarty, formerly assistant superintendent of the plant of the Goodyear Tire & Rubber Co. at Akron, and later superintendent of the company's plant in Canada, has severed his connection with the Goodyear company. Mr. Moriarty has had many years' experience in the management of rubber factories in the United States and Canada.

Mr. William Fewell has been made manager of the New York City branch of the Lee Tire & Rubber Co. of Conshohocken, Pennsylvania.

Mr. Trumbull Warren, president and treasurer of the Gutta Percha & Rubber, Ltd., Toronto, was among the first to volunteer for war service in the Canadian contingent.

THE UNITED STATES TIRE CO. HAS NEW MANAGER

Mr. J. D. Anderson, who has been identified with the manufacture and sale of tires for the last twenty years, has resigned as general sales manager of the United States Tire Co., his successor being Mr. Joseph C. Weston, the Central District manager for the company, who has lately been acting as general sales manager in Mr. Anderson's protracted absence in Europe.

Mr. Weston is also a veteran in the tire trade, having been secretary of the Morgan & Wright Co. for many years. Later, on the formation of the United States Tire Co., he became its Western District manager, with headquarters in San Francisco. From this position he was promoted to the Central District managership.

HARRY N. TOWNER

Harry N. Towner, president of Towner & Co., of Memphis, Tennessee, died at his home in that city September 22. He was stricken with apoplexy on September 10 and owing to the fact that he had been in impaired health for the last five years he was not able to rally from the attack.

Mr. Towner was born in Connecticut April 3, 1851. His boyhood was spent in the city of Baltimore, but he was educated in the Episcopal college in Cheshire, Connecticut. While still a young man he became associated with his father in the firm of Towner, Landstreet & Co., of Baltimore, in the mill supply business. He went to Memphis in 1879 and established the firm of Towner & Co. for the wholesale distribution of all kinds of rubber goods, and when the firm was incorporated in 1905 he became its president, his son, R. Paul Towner, being secretary and treasurer.

TRADE NEWS NOTES

The Toledo Rubber Co., which deals in rubber goods of all kinds for the vehicle, hardware, railroad, shipping, drug and clothing trades, under the brand name "Torco," has recently enlarged its offices and sales rooms at 428-30 Summit street, Toledo, Ohio. The company now occupies a modern five-story fireproof building 40 feet wide and with a total floor space of 24,000 square feet.

An analysis by chemists of the State Food Department of the chewing gums being offered the public discloses the fact that four of the brands labeled "pepsin gum" contain no pepsin whatever. The manufacturers have been notified that they must discontinue the sale of this misbranded gum or prosecution to the full extent of the law would follow.

More than 400 conductor miles of wire for distributing electric energy and light service have already been called for in specifications for the new Equitable building under construction in New York. This wire will be supplied by the Simplex Wire & Cable Co., of Boston.

The second International Safety Exposition will be held from December 12 to 19 at the Grand Central Palace, New York, when a large number of foreign and government exhibits will be shown in addition to those of industrial enterprises. Awards will be made in five grades to exhibitors in every branch of industry.

That the war in Europe has had no serious effect on the automobile trade of the United States, or on the buying capacity of the public, is shown by the fact that during August the Ford Motor Co. sold 20,638 cars. This company sold during the year to August 1, 221,888 cars, an average of about 18,500 a month.

The Loewenthal Co., 37 West Thirty-ninth street, New York, well-known operators in scrap rubber, have taken the agency of L. M. R., a popular mineralized rubber which has been on the market for many years. The reputation of this product, supplemented by the progressive methods and extensive connections of the Loewenthal Co., would seem to assure large sales of L. M. R. in the rubber trade.

The annual meeting of the Intercontinental Rubber Co. will be held in Jersey City on October 5. Proxies have been distributed by the company in the names of Edward B. Aldrich and Willard B. Smith.

The Midgeley Tire Co. is now operating its plant at Lancaster, Ohio, in the production of the Midgeley Tread tire.

Contracts have been let for the erection of a \$5,700 addition to the factory of the American Rubber Reclaiming Co. at 406 East Rittenhouse street, Philadelphia.

A decrease of the capital stock of the Asbestos & Rubber Works of America, of New York, from \$75,000 to \$40,000, was authorized on September 23.

The Morgan & Marshall Co., which manufactures the M. & M. tire, has recently made quite a generous contribution toward the Lincoln Highway, purchasing fifty memberships in the association, at a cost of \$250.

Fire Commissioner Adamson, of New York, who believes that efficiency and economy in the purchase of hose may be effected by having specifications occasionally reviewed by business experts acting with the fire department heads, is to appoint a committee for this purpose, to be composed of representatives of the Board of Fire Underwriters, the Chamber of Commerce, the Merchants' Association, the Board of Estimate and Apportionment and the Fire Department. The work of a similar committee appointed three years ago resulted in a revision of specifications which reduced the price of 2½-inch hose from \$1.20 to 68 cents a foot.

A well known rubber man who has become identified with the house of Charles E. Wood is Mr. W. C. Betts, formerly of DeLong-Betts company. Mr. Betts has had a long and successful career in the rubber trade and is probably one of the best known crude rubber men in the United States. His present location will afford an excellent opportunity for him to renew his large acquaintance in the trade.

Lyman M. Bourn, for five years chief chemist and manager of the materials department of the Goodyear Tire & Rubber Co., Akron, has severed his connection with that company to accept a position as manager of the Double Fabric Tire Co., Auburn, Indiana.

WHERE RUBBER HOSE TAKES THE PLACE OF FIRE.

Taking it all in all, a piece of rubber hose can be put to more uses than almost anything else in the world. A dweller in a city apartment house with an active mind has devised a new use to which a piece of hose can be put with great benefit. Like many other unfortunates, he lives in a house having steam heat but no hot water supply, being obliged to depend for his hot water on the kitchen range, which requires time to do its work. But having a steam radiator in his bath room, he took out the piece of pipe between the radiator and the standard pipe, inserted a T with a short projecting piece of iron pipe, which contained a valve. The rest was easy. To this short piece of pipe he attached a rubber hose long enough to reach well into the tub. Then to the tub end of the hose he attached a large open wire bulb around which he wrapped a cloth. He then filled his tub, dropped the end of the hose with the bulb into the water, turned the valve in the short piece of iron pipe and let the steam into the hose, through which it rushed, passing in a quiet and orderly manner through the cloth around the bulb and soon heated the water to a comfortable temperature thus saving time and gas bills.

Should be on every rubber man's desk—Crude Rubber and Compounding Ingredients; Rubber Country of the Amazon; Rubber Trade Directory of the World.

TRADE NEWS NOTES.

The selection of a date for the sale of the Walpole Tire & Rubber Co., of Walpole, Massachusetts, has been postponed until October 15, although the matter may be brought up before that time by any interested party on service of a week's notice.

It is understood that plans have been proposed—and a stockholders' meeting called for their consideration—for taking this company out of the receivers' hands and placing it under the management of new directors. Under such a reorganization the board of directors would be composed of John H. MacAlman (president), Fayette S. Curtis (first vice-president), George E. Keith (second vice-president), Charles H. Keith (treasurer), Franklin H. Downs, John S. Rand and Elisha B. Powell—all, with the exception of Mr. Powell, who is an attorney of Oswego, New York, being prominent Massachusetts business men.

An endurance test in which twenty-four motor trucks of various makes took part was recently held in California over an extremely rough 200-mile course, starting and ending at Los Angeles and leading through Riverside, Redlands and San Bernardino. The best record was made by a 1,500-pound Menominee truck, equipped with Firestone tires.

According to statistics filed in the office of the Board of Assessors for Chicopee, Massachusetts, the Fisk Rubber Co. will pay this year taxes amounting to \$10,000, the third in size of the city's assessments on manufacturing or business concerns.

Owing to the war in Europe and to the fact that many members of the Society would probably neither care to attend nor be welcome in Canada at this time, the American Chemical Society decided not to hold its annual meeting at Montreal during September, as had been planned. The annual meeting for 1915 is scheduled for April 1 to 3, at New Orleans.

An inflated tire tube recently saved the life of a young woman, who, while bathing in a New Jersey lake, got in beyond her depth and, being unable to swim, had sunk for the second time when her companion pushed the inflated tube out within her reach and so assisted her to safety.

The Carriage Builders' National Association is holding its forty-second annual convention at Atlantic City, from September 26 to October 2. Among those taking part in the exhibition at the Million-Dollar Pier, held in connection with this convention, are the Firestone, Goodyear and Kelly-Springfield companies, exhibiting tires, and the F. S. Carr Co., the L. C. Chase Co. and the Fairfield Rubber Co. showing artificial leather.

During the year 1912 there were 20,248,326 miles of wire in use in the telephone lines of the United States—a gain of 15,347,875 miles over the quantity in use ten years ago.

The desirability of wearing rubber gloves while engaged in certain electrical work is very strongly impressed upon workmen in rules for men engaged in electrical work recently submitted at a convention of southern electrical associations; while those operating switchboards are just as strongly urged to always stand on a rubber mat.

A canvass of the automobile industry by the National Automobile Chamber of Commerce shows a quick recovery from the effects of the war, shipments of 6,870 carloads having been made during August; and it is believed that the fall trade will very nearly reach previous expectations.

Protests have been entered by various ambassadors against the export of American automobiles to the warring nations, and there seems to be some intention of classing such shipments as "munitions of war and supplies."

Statistics show about one automobile for every two miles of country road in the United States.

DATES OF THE AUTOMOBILE SHOWS.

The Electrical Vehicle Show will be held in the Grand Central Palace, New York, from October 7 to 17.

The National Automobile Show, promoted by the National Automobile Chamber of Commerce, will be held in the Grand Central Palace, New York, January 2 to 9.

The National Automobile Chamber of Commerce will also promote a National Automobile Show to be held in the Coliseum and First Regiment Armory, Chicago, January 23 to 30. The shows under the auspices of the National Chamber are to be invitation affairs, only such motor car and accessory manufacturers as are members of the Chamber, and to the number that can be properly cared for, being invited to exhibit.

The Automobile Dealers' Association of Pittsburgh is promoting an automobile show to be held October 17 to 24.

At San Francisco the Panama-Pacific Exposition Co. is promoting the following races, to be held at the exposition grounds: Vanderbilt Cup Race, February 22; Grand Prize Race, March 7; Panama Pacific Cup Race, March 14.

KEATON TAKEN OVER BY THE COMBINATION.

The Combination Rubber Manufacturing Co., with factory and general offices at Bloomfield, New Jersey, and a tire department branch at 1790 Broadway, New York, has taken over and will continue the business of The Keaton Tire & Rubber Co., which manufactured special brand tires and tubes for a number of the large tire jobbing concerns. Mr. H. A. Forbes, former general manager of the Keaton company, is manager, and Mr. Frank C. Braden, sales manager of the tire department of the new concern.

A FAMILY HEIRLOOM CARRIED IN A RUBBER HEEL.

A lucky turn of events in which a rubber heel and an honest bootblack each played a part recently restored to a certain fortunate young woman a jewel of much beauty and great value, highly prized as an heirloom, which she had lost en route from Europe to New York on board the "Imperator." A thorough search failed to disclose the whereabouts of the lost jewel—a large pigeon-blood ruby—and it was not until after arrival in New York, when a bootblack of the Hotel Astor was polishing the shoes of the young woman's father, that the discovery was made. The ruby had become lodged in the rubber heel, in a recess formed to receive a nail for attaching the heel to the shoe.

TRADE OPPORTUNITIES FROM CONSULAR REPORTS.

A firm in Spain desires to represent American houses dealing in crude and manufactured rubber of all kinds. Correspondence and catalogs should be in French and Spanish and metric units should be used; prices to be in gold pesetas (peseta equals 19.3 cents) f. o. b. any American seaport having direct connections. Report No. 13,595.

A business man in Oceania would be glad to receive catalogs and price lists from American manufacturers of surgical elastic, hosiery, abdominal belts, rubber gloves, etc. Report No. 13,678.

A large engineering company in Great Britain desires to correspond with manufacturers in a position to quote favorably on armored cables for high and low tension service. Report No. 13,758.

A dealer in Great Britain wishes correspondence with American manufacturers of ducks, drills, sheetings, etc., with a view to securing representation for that country. Report No. 13,779.

A leading wholesale chemist and druggists' supply house in Great Britain is reported in the market for a number of American sundries—vulcanite goods, douche fittings, syringes, surgical rubber goods, atomizers, etc. Report No. 13,761.

An import agent in Europe wishes to purchase, for cash, rubber shoes, etc. Correspondence may be in either English or Norwegian. Report No. 13,805.

TRADE NEWS NOTES.

The Miller Rubber Co., of Akron, which recently issued \$500,000 of new first preferred stock, has purchased land adjoining its present holdings with a view to further extension of its manufacturing facilities.

The Blodgett Rubber Co., a \$500,000 corporation of Warren, Ohio, has completed arrangements for the removal of its tire manufacturing plant to St. Joseph, Michigan, the Development company of that city having agreed to furnish a factory site and building which at the end of five years should under certain conditions become the property of the Blodgett company.

A factory for the manufacture of rainproof cloth is soon to be established at Fulton, Kentucky, by Harrison Brothers, of Union City, Tennessee.

The American Chiclet Co. has issued \$2,000,000 of additional stock and acquired the assets of the Sen Sen Chiclet Co., of Maine.

The capital stock of the Syracuse Rubber Co., of Syracuse, New York, has been reduced from \$25,000 to \$500, and a similar reduction has been made in the capital of the Rochester Rubber Co., Rochester.

The requirements of the fire department of Philadelphia necessitate keeping 126,000 feet of hose in active service, there being in the city 83 fire stations, each of which uses from twenty to twenty-five lengths of 50 feet.

A new form of polo has been introduced which is sure to gain favor among the tire manufacturers. The players are mounted on bicycles, the front wheels of which take the place of mallets in driving the ball.

A tire and accessory manufacturing company which will employ 60 men at the start has been incorporated in Ohio with a capital stock of \$350,000, under the name of The Toledo-Ford Tire Co. Plans under consideration call for the erection at Toledo of a brick and steel plant 60 x 250 feet in area, with equipment for a production of about 200 tires a day at the start. The incorporators are: R. F. Teall, C. E. Taggart, William Dunbar, L. P. Eichenberg and E. F. Felton. It is expected that the new plant will be ready for operation soon after January 1.

The Converse Rubber Shoe Co., of Malden, Massachusetts, has just been awarded a contract for furnishing the United States Navy Department with 1,200 pairs of Arctic shoes, at \$1.81 per pair.

Plans are under way for the erection of a \$50,000 brick plant, 80 x 250 feet, one story high, at New Brunswick, New Jersey, for the Endurance Tire & Rubber Co., of 1789 Broadway, New York.

The Whitall-Tatum Co. is adding to its plant at Millville, New Jersey, the cost of the new addition being estimated at \$30,000.

A rumor that the Hartford Rubber Works, of Hartford, Connecticut, would remove to Detroit, Michigan, has been denied by Charles B. Whittelsey, secretary of the company and factory manager.

The Stoddard Rubber Co., of Worcester and Millbury, Massachusetts, recently incorporated with a capital stock of \$60,000, will manufacture and deal in rubber, rubber tires, etc.

The H. W. Johns-Manville Co., of New York, has purchased the plant of The United Indurated Fibre Co., at Lockport, New York.

The Faultless Rubber Co., of Ashland, Ohio, is erecting a factory building 80 x 120 feet, three stories high.

At the works of the I. B. Kleierr Rubber Co., College Point, New York, several departments have been closed as a result of conditions caused by the war.

NEW INCORPORATIONS.

Accident Proof Tire Co., August 22, 1914, under the laws of New York, authorized capital, \$250,000. Incorporators: Keri L. Albertson, 54 Morningside Drive, New York City; James O. Hodge, 878 East Twenty-third street, and Carl W. Stuart, Oriental Hotel—both of Brooklyn, N. Y. To manufacture and deal in Cumberland tire filler and other auto accessories.

Brooklyn Tire Co., Inc., September 15, 1914; under the laws of New York; authorized capital, \$10,000. Incorporators: Willard J. Woodcock, Frank W. Woodcock and Beatrice Woodcock—all of 102 Gates avenue, Brooklyn, N. Y. Tires and rubber goods.

Crow Gum Co., August 6, 1914; under the laws of Delaware; authorized capital, \$100,000. Incorporators: F. D. Buck, George W. Dillman and M. L. Horty—all of Wilmington, Del. To acquire the business carried on by the Crow Gum Co., of Memphis, Tenn.

Hester Tire & Rubber Co., The, September 9, 1914, under the laws of Delaware; authorized capital, \$300,000. Incorporators: B. H. Friel, L. A. Browhill and G. M. Purcell—all of Wilmington, Del. To deal and trade in all kinds of rubber, etc.

Manufacturers' Rubber & Supply Co., The, August 20, 1914; under the laws of Illinois; authorized capital, \$10,000. Incorporators: W. E. Anderson, W. R. Anderson and N. Johnson. To manufacture, buy and sell automobile appliances, accessories and rubber goods of every description.

Parr Auto Shoe Co., September 10, 1914; under the laws of Indiana; authorized capital, \$10,000. Incorporators: W. A. Parr, G. E. Parr, William Featheringill and S. W. Featheringill—all of Franklin, Ind. To manufacture anti-skid or emergency shoes and other accessories for automobiles.

Positive Puncture Plug Co., September 4, 1914; under the laws of Illinois; authorized capital, \$15,000. Incorporators: J. H. Nowlin, F. C. Corbitt and O. W. Pellage. To manufacture, sell and deal in automobile supplies, specialties, accessories, etc., and to carry on any trade or business incidental thereto or connected therewith.

Russian-American Rubber Tire Works, Inc., September 8, 1914; under the laws of New York; authorized capital, \$100,000. Incorporators: Rose Miller, 477 Stone avenue; Isidore Kelner and Sruel Billik—both of 1549 Pitkin avenue—all in Brooklyn, N. Y.

Stoddard Rubber Co., Inc., September 4, 1914; under the laws of Massachusetts; authorized capital, \$60,000. Incorporators: Charles H. Stoddard, F. Madge Stoddard and Samuel L. Cowitz—all of Worcester. To buy, sell, manufacture and deal in crude rubber or rubber compounds and rubber tires for vehicles.

Washington Heights Auto Tire Works, Inc., September 21, 1914; under the laws of New York; authorized capital, \$5,000. Incorporators: William J. Buckley and Edward Buckley—both of 1748 Amsterdam avenue—and William F. Keyes, 526 West 145th street—all in New York, N. Y.

VACUUM-CLEANING THE HORSE.

The modern housekeeper would be at a loss how to proceed in keeping her home immaculate if she didn't have some sort of a vacuum cleaner; and what is good for the house is evidently good for the horse, for a vacuum cleaning apparatus is being used by some of the New York City departments for the grooming of the municipal steeds. The horse is first curried vigorously, so as to loosen up the dirt and dirt and germs, and then the cleaner is applied and all loose and unnecessary particles are carried off into the dust bag—a great improvement on the old system of getting the dirt off of one horse to supply the cleaner with dirt for the next. Nothing of what went into the lungs of the animal.

New Rubber Goods in the Market.

THE SEASON'S NEWEST COATS AND HATS.



The raincoats here illustrated represent a decided variation in style from anything previously noted in these columns. The first two models are in cape effect, the young woman's coat being of worsted, in a variety of color combinations, with a coating of rubber on the inside and cut with cape effect sleeves—which may be fastened close to the wrist by means of a glove clasp joined to the body of the coat in raglan style. The girl's rubberized cape coat is made with convertible collar and slashed pockets.



The London slip-on model is made in men's and youth's sizes, of double texture gabardine, with raglan or plain sleeves and with patch pockets.

The girls' coats represent such materials as Donegal Scotch tweed with cravenetted silk-lined yoke

and sleeves; rubberized poplin, and Priestley's English cravenetted mixed tweed. Both slit and patch pockets are shown, and plain and belted designs.

Each reproduction shows the waterproof hat appropriate to the style of coat worn.



RUBBER CEMENT CLEANER.

In the process of manufacture of canvas and leather shoes of white or delicate colors the uppers are usually covered with paper or cloth to prevent soiling. But in spite of this there is bound to be more or less dirt or stain in the handling, and frequently the cement used in attaching the soles daubs the upper. The general practice in factories is to use a cement ball, which is practically a piece of sponge rubber which in using assumes a spherical shape, but which in handling must take more or less dirt from the operator's fingers, while its shape prevents its use in crevices, etc. To take the place of this ball a cleaner has been devised which has somewhat the form of a buffing wheel or emery wheel. There is a tubular core around which the sponge rubber is arranged. This allows the cleaner to be grasped by the thumb and fingers, and in use the rubber wears equally, thus maintaining the wheel-shape. While it is not so stated by the manufacturers, the cleaner is evidently capable of being placed on a revolving shaft or spindle for quick work. [United Shoe Machinery Co., Boston.]



A RUBBER RELIEVER OF BUNIONS.

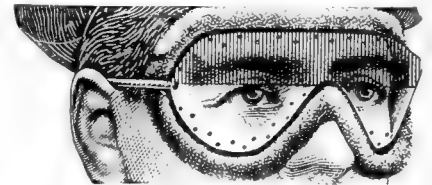
Doctor Scholl, presumably a doctor of chiropody—has prepared a small article for the relief of those who are possessed of bunions. It consists of a small, soft, pliable piece of rubber that fits in between the great and second toes and is kept in

place by thin rubber head and foot pieces. It looks, as a matter of fact, something like an enlarged collar button, with two hollow spaces running through its length. While this is so pliable as not to be uncomfortable, its effect is to force the great toe out into its normal position and thus relieve and in time cure the bunion.

Another invention of the Doctor's is a corn pad, also made of soft, pliable rubber, in various sizes, intended to alleviate the sufferings of those afflicted with corns on the toes, tender joints or callouses on the soles. [Scholl Manufacturing Co., 337 Broadway, New York City.]

GOGGLES WITH A SOFT RUBBER RIM.

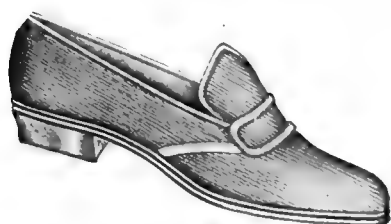
A Chicago house has recently put on the market an eye protector called the "Dimmer Goggle," intended particularly for the motorcyclist. These are finished with a soft rubber rim which enables the protector to press closely against the face without creating any disagreeable feeling. These goggles are made of celluloid in five different colors—clear, amber, smoke, green and blue; and those made of amber color have an extra green strip about three-quarters of an inch wide running across the top, which makes it possible for the cyclist, by lowering his head a trifle, to face the setting sun or to ride immediately under a strong electric light without having his eyes at all affected. [Chicago Eye Shield Co., 128 South Clinton Street, Chicago.]



Replete with information for rubber manufacturers—Mr Pearson's "Crude Rubber and Compounding Ingredients."

SIX NEW TENNIS SHOES.

When tennis shoes were worn almost exclusively in playing tennis and other sports, or at least were confined in their use very largely to summer outings, they were made altogether without heels, this form being best adapted for wear in outdoor games. But recently these light rubber-soled shoes have become so popular for general wear that there has arisen a demand for similar shoes with heels, and in consequence the new tennis price list issued by the United States Rubber Co. shows six new shoes which have not appeared in any of their previous pub-



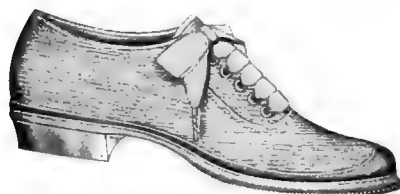
COLONIAL PUMP.



EMMY LOU PUMP.



WOMEN'S PARADE PUMP.



WEEK END OXFORD.



QUARTER DECK BAL.



REGATTA OXFORD.

lications, five of these shoes having heels. The accompanying cuts show their general appearance.

All of these shoes have rubber soles and heels, with duck uppers. The "Quarter Deck" and the "Colonial Pump" are made of buff or pure white palmetto duck with lining to match. The "Regatta" and "Week End Oxford" are made of white or brown duck, the former having a white rubber sole, the latter a gray rubber sole. The "Parade Pump" is made in black or white duck, with rubber soles and heels to match; while the "Emmy Lou Pump," evidently intended for young girls and children, is made of white duck with white soles or golden glow duck with red soles. As these duck shoes with rubber soles and heels are so much lighter and more comfortable—to say nothing of being so much less expensive—than leather shoes, they are likely in the future to be very extensively worn through the summer months.

PNEUMATIC TIRES FOR THE BABY'S HEAD.

A humane woman of Philadelphia, the city of brotherly love—including the extremely young brothers—has thought out a simple apparatus for keeping infants from bumping their heads on the floor or the wall. It consists of a pneumatic tube which goes around the forehead and the back of the head, with two similar tubes crossing over the top. This pneumatic harness is fastened on the head just like a hat, with a strap going under the chin. Equipped with this resilient accoutrement, the youngster can knock his head in any direction and extract only amusement from the process. It is probable that for sick children, who are very liable to tumble on slight provocation, this would prove a useful device, but for the ordinary youngster a certain number of bumps are a good thing, serving as a valuable preparation for the bumps of later life.

EBONITE MOLDING.

Ebonite molding for automobile bodies is now being turned out in a variety of designs. This molding, while more especially suitable for black finished vehicles and considerably more expensive than wood, retains its finish without much care and is said to hold its shape, being easily bent to almost any curve.

AN OPEN WORK PENHOLDER.

A new penholder has recently come on the market, made of hard rubber, differing from hard rubber penholders previously offered for sale in being hollow and having two long slits on opposite sides running half the length of the holder and two sets of short cross slits opposite each other between the two long openings. This slitted open effect makes the penholder light and somewhat elastic, so as not to tire the fingers even where one grasps his pen with unnecessary energy. [Tower Manufacturing & Novelty Co., New York.]

RUBBER COVERED TEMPLES FOR GLASSES.

A good many people who wear spectacles chronically have experienced the disagreeable sensation of having the temples (the name given to the wires that go over the ears) cut into the flesh, or at least chafe it. This is particularly likely to happen in hot weather, and is especially liable to occur where people are engaged in active exercise. To avoid this difficulty the F. W. King Optical Co., of Cleveland, Ohio, manufacturers of sportsmen's glasses, make a great many glasses in which a small, delicate rubber tube is pushed over the temples so that the wire does not come in contact with the ear or the head. This rubber covering not only tends to prevent chafing but holds the glasses firmly in place, a condition much to be desired by men who are in pursuit of game and therefore need the most accurate sight possible.

VACUUM CLEANERS FOR PULLMAN PORTERS.

That prophet of uplift and seer of visions, Elbert Hubbard, recently contributed to the magazine sections, which form a very readable part of many of the metropolitan dailies, an article on the unsanitary phases of the Pullman car, and he called particular attention to the industrious porter, who, just before the arrival of the train at its destination, grabs the helpless passenger and with his whisk broom removes the dust from his clothing on to that of his neighbors, and then, after receiving his tip, proceeds to remove the dust from the neighbors back on to the helpless traveler. Mr. Hubbard suggests, in place of this whisk broom, that simply moves the dust from one place to another to move it back again, that the porter be equipped with a vacuum cleaner—supplied of course with the proper length of rubber tubing—with which he can go over the person of the traveler, removing the dust in such a way that it would fly out into the outer air. This is a most excellent suggestion, and if the suction were made strong enough so that, after the cleaner had removed all the dust from the traveler's clothing, it would seize upon the porter and carry him also out into the outer air its popularity would know no bounds.

THE PUMP WITHOUT A GAP.

One defective feature has persistently appeared in every pump model that has so far been presented—it spreads at the arch when the foot is bent. But here is a model for which the claim is made that "no matter how the wearer bends her foot, this pump will never gap at the sides, either walking or standing." This being the case, one problem of the manufacturers is solved, for the pump is extremely attractive in appearance, the part that fits so closely around the foot being made of an entirely new elastic shoe cloth woven especially for pumps. It is made in black, white, bronze, pink and blue, in plain or brocade finish. [Hub Gore Makers, Boston.]



ERASER WITH PERPETUAL POINTS.

Where one wishes to erase a very considerable surface it makes no particular difference whether an eraser has a sharp point or a dull point; but it usually happens that the erasure to be made consists only of a small line, and it is quite desirable under these conditions to have an eraser with a sharp point. To meet this situation a Philadelphia company has put on the



market an eraser called the "Dandy" which, as is shown in the accompanying cuts, has a number of open parallel slits. As a result of this construction it is easy when the points or corners are worn down to remove a section of the eraser with a knife and start on the next section, with a new set of sharp pointed corners. These erasers are made in two shapes, one with rectangular corners and the other with diamond shaped ends. They are made also both for pencil use and for pen use. [John S. Rapsin, 51 North Sixth street, Philadelphia.]

A NEW DIXON ERASER.



To the wide variety of erasers on the market another style has lately been added. This is Dixon's 10955 red and gray disc eraser, a full size cut of which appears here with. The section composed of red rubber is intended for pencil marks and the gray for ink and typewriter erasures. [Joseph Dixon Crucible Co., Jersey City, New Jersey.]

TWO NEW DRESS SHIELDS.

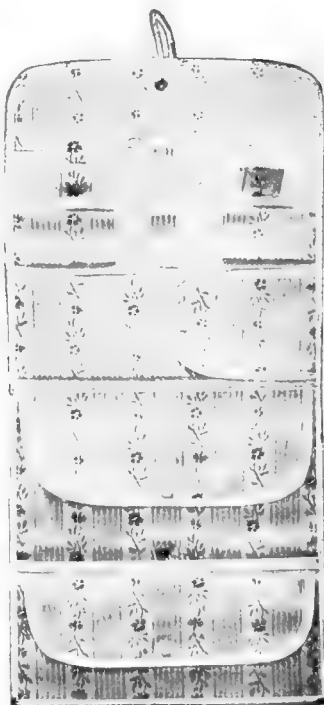
One is made of pink silk, rubber proofed on one side, with pinked edges. The flesh tint and gossamer weight make it appropriate for evening or full dress gowns of diaphanous materials. It is also suitable for blouses of sheer material.

The other is of rubber-proofed silk, covered with flesh tint silk. The edges are finished with buttonhole stitching in the same shade. This is undoubtedly the finest and newest shield made. It is intended for both class gowns and fastidious dressers.

THE OVERNIGHT TOILET CASE.

A very convenient and necessary traveling case for a week-end visit, it is designed and made up to meet the requirements of the most fastidious. The case is rubber lined throughout and has a limited number of pockets to accommodate the necessary toilet articles. As the name indicates, it only provides space for such articles as a short sojourn would require. In design it resembles a novel shaped hand bag provided with a convenient carrying handle. The case opens at the bottom and when in use it is spread out upon the dresser or some convenient table. It is readily closed when the case is lifted by the handle, thus folding the halves together, which are held by several glove fasteners provided for that purpose. It comes in cretonne, mercerized gingham, plain and fancy silks.

The other cut shows a rubber-lined tourist case of entirely



new design that will appeal to the traveler. It is provided with an assortment of pockets of various shapes and sizes to accommodate the many articles used in the toilet. Considerable thought has been given to this feature in order to provide convenient places for the articles necessary when traveling. When in use the case is suspended and open, thus affording easy access to each toilet article. The case can be folded up and tied, when so desired, by a band provided for that purpose. It makes a neat and attractive receptacle for toilet accessories and occupies but little space in the traveling bag. It is made of materials similar to those employed in the overnight case. [Stern Specialty Co., 40-42 East Twenty-Second street, New York.]

RUBBER BANDS TO SAVE THE FINGERS.

It falls to the lot of a good many people doing clerical work in offices to be obliged to turn over a mass of letters or other documents in search of some particular paper. To do this one naturally lifts up the corner of the sheet with his finger, and in order that the finger may take hold of the paper it is generally customary to have a wet sponge at hand on which the finger can be frequently moistened. But this process if long continued is liable to result in a rather disagreeable sensation. To obviate this some inventive genius has devised a little corrugated rubber band which goes over the end of the finger, being loosened or tightened by a small buckle, and which has enough friction in its rubber surface to catch up the loose sheets of paper. [Tower Manufacturing & Novelty Co., New York.]

Should be on every rubber man's desk—Crude Rubber and Compounding Ingredients; Rubber Country of the Amazon; Rubber Trade Directory of the World

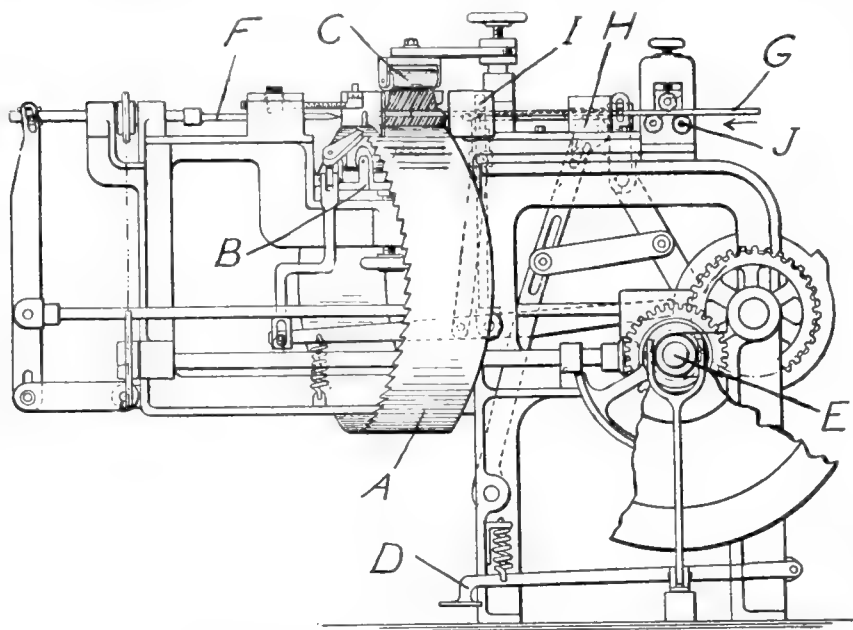
New Machines and Appliances.

PLACING CROSS WIRES IN TIRES.

THE accompanying drawing shows a machine for inserting the cross wires in the bases of solid tires. The machine performs this operation on the finished tire of annular form, after vulcanizing. The tire is placed on a drum *A* having a ratchet in one edge so that it can be advanced step by step. This drum is mounted on a turn table *B* so that the tire can be turned to permit of inserting the wires at any angle to the base of the tire. With the tire in position and held down by a roller *C*, the treadle *D* is pushed down by the operator, engaging a clutch on the driving shaft *E* and causing a drill *F* to advance and bore a hole through the tire. When the drill is withdrawn, the wire *G* is gripped by a cam *H* and the end pushed forward into the hole in the tire. The wire is then cut off the proper length by a shear *I*, and the end projecting from the tire is pushed into place by a hammer automatically operated. The wire is straightened as it is drawn from the supply wheel by

and *I*, where it is sheeted, and stamped with any design or wording which may be engraved on the smaller roller.

[Pat. No. 1,110,340, September 15, 1914. L. Norzagaray, assignor to the Economic Washing Machine Co., London, England.]

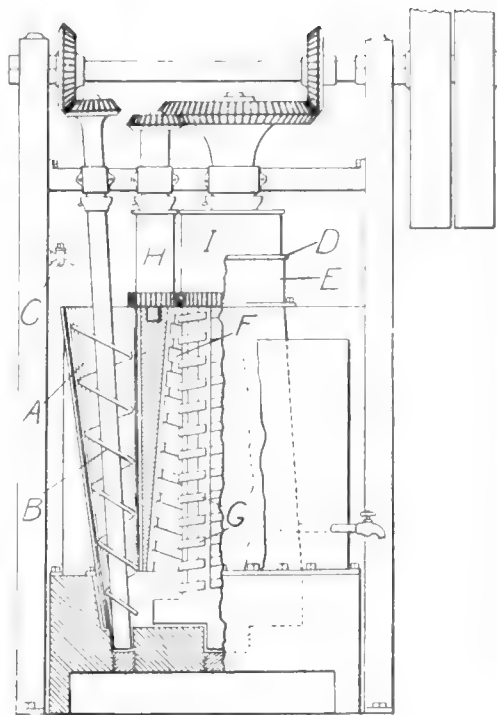


KUENTZEL'S MACHINE FOR INSERTING CROSS WIRES.

being passed between rollers *J*. [Pat. No. 1,110,800, Sept. 15, 1914. C. Kuentzel, assignor to The Goodyear Tire & Rubber Co., Akron, Ohio.]

NORZAGARAY'S EXTRACTOR AND WASHER.

ANOTHER interesting machine just patented in this country is an extracting and washing machine designed by Norzagaray and illustrated by the accompanying drawing. The machine is designed for cleansing crude rubber, as well as for kneading and rolling it into sheets. The rubber is fed continuously into the top of a conical tube *A* and is forced down by the conveyor screw *B* until it passes out at the lower end of the tube. Hot water is kept running over the rubber from a tap *C* and from a perforated pipe *D* at the top of the tank *E*. Formed on the inside of this tank are spiral threads *F*, which engage spiral ribs *G* on a cylinder rotating in the tank. The rubber emerging from the lower end of the tube *A* is forced upward by these spiral ribs and thoroughly masticated while the hot water is continuously running over it. The mass of rubber emerges at the top of the tank and is passed between vertical rollers *H*



NORZAGARAY'S WASHING MACHINE.

EXTRACTS FROM RECENT PATENTS.

The following are brief extracts from the specifications of other interesting United States patents recently granted.

PULVERIZER FOR SCRAP RUBBER.

No. 1,102,789, July 7, 1914. Joseph Ogden, Manchester, England. A machine for grinding or pulverizing scrap rubber. The rubber is fed into a cylindrical hopper and comes in contact with a rapidly revolving disc having an abrasive surface or sharp cutting edges in the form of spirals.

METALLIC STOCK SHELL.

No. 1,104,296, July 21, 1914. William F. Gam-meter, Cadiz, Ohio. Metallic stock shell for winding up sheeted rubber or coated fabric as it comes from the calender. This roll is entirely of metal and is designed to facilitate cooling. It is an improvement on patent No. 1,003,593 of 1911.

LAST MAKING MACHINE.

No. 1,104,040, July 21, 1914. E. A. Eastman, assignor to the Crawford McGregor & Canby Co., Dayton, Ohio. Automatic machine for turning shoe lasts. It is interesting to note that, although the patent just granted covers minor improvements, the original of this machine was illustrated and described in THE INDIA RUBBER WORLD of May, 1904.

JAR RING AND GASKET LATHE.

No. 1,107,404, August 18, 1914. F. Brelle, Sr., and F. Brelle, Jr., Ferndale, California. A machine for cutting rubber gaskets or jar rings, wherein the rubber tube is placed on a revolving spindle and the cutter is automatically fed forward and advanced toward the tube. The knife may be adapted for cutting rings with a curvature in cross-section of almost 90 degrees.

DENTAL VULCANIZER

No. 1,107,441, August 18, 1914. N. W. Olson, Galesburg, Illinois. A vulcanizer for curing dental goods, opened and

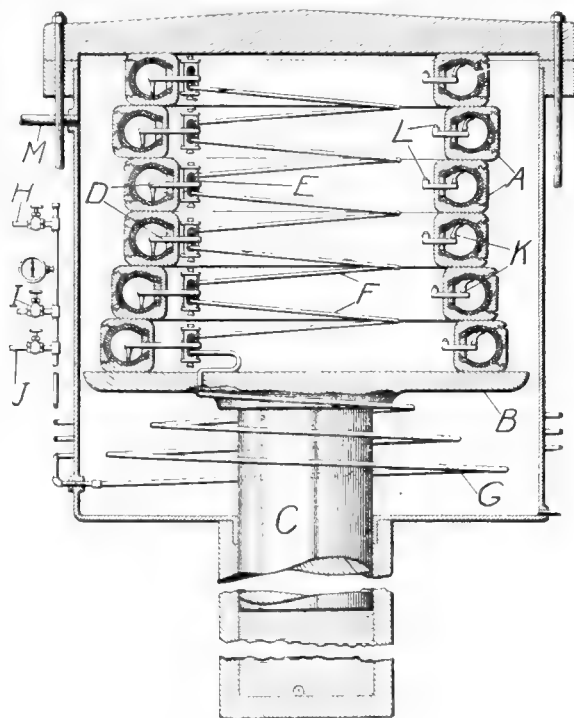
closed by a steam cylinder whose piston has an extension for operating a rheostat, for controlling an electric coil which supplies heat for vulcanization.

IMPREGNATING BRAIDED HOSE.

No. 1,110,671, September 15, 1914. Henry Z. Cobb, Winchester, Massachusetts. An apparatus for passing the thread through a rubber solution to impregnate it before being woven into hose. The woven hose subsequently passes through a die to remove the surplus material. This patent constitutes an improvement on Cobb's patent No. 1,002,644 of 1911.

TIRE VULCANIZING PRESS.

AMONG the recent inventions in the field of rubber manufacturing machines is the tire vulcanizing press illustrated herewith. This vulcanizer is very simple both in construction and operation. The tires are first built up and placed in molds *A*, which are laid one above the other on the table *B* mounted on the hydraulic ram *C*. Each mold has a pipe *D* running from



DEES' TIRE VULCANIZER.

the interior of the tire to a valve *E*. These valves are all connected by flexible pipes *F* communicating with the outside of the vulcanizer through a flexible pipe *G*, having three valves, *H*, *I* and *J*. Each mold also has a tube *K* with a valve *L*.

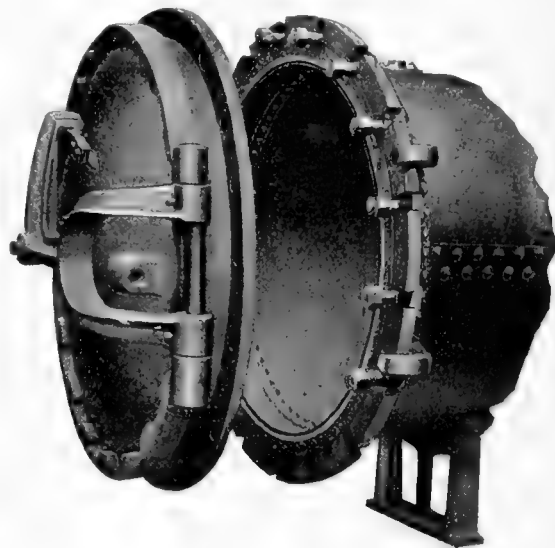
When the molds are in place and compressed by raising the hydraulic plunger *C*, the valve *H* is opened and cold water is let into the tires until they are filled, when it runs out through the tubes *K*, closing the valves *L*. The valve *H* is then closed and steam is admitted to the vulcanizer through the pipe *M*. As the water inside the tires becomes warm by the heating of the molds, it expands and exerts an outward pressure on the tires. At the proper time the valve *J* is opened and the pressure of the steam opens the valves *L*, forcing the water out of the tires and filling them with steam. The valve *J* is then closed and the steam valve *I* opened, producing a pressure in the tire greater than that in the surrounding vulcanizer. This pressure is maintained until the curing process is complete. The principal advantage claimed for this apparatus is in the pressure exerted on the interior of the tire by gradually raising the temperature of

the water. [Pat. No. 109,048, Sept. 1, 1914, M. A. Dees, St. Louis, Missouri.]

A BOLTLESS QUICK-OPENING VULCANIZER.

THE new boltless quick-opening vulcanizer head, manufactured by the Williams Foundry & Machine Co., Akron, Ohio, and illustrated herewith, presents several novel improvements.

The cast-steel shell ring and door have each a series of projecting lugs. The door is turned, by means of an iron bar in-



THE WILLIAMS BOLTLESS VULCANIZER.

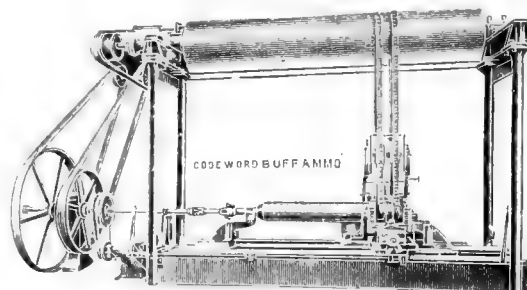
serted into one of the projections, so that its lugs are forced under the lugs of the head-ring. This makes it impossible for the door to be forced outward. The door rotates on a trunnion at its center, which is a part of the cast-steel door hinge, permitting it to be swung open like any ordinary vulcanizer head. Stops are provided so that the operator is always sure to have the door in the proper position before the steam is turned on.

When steam is turned into the vulcanizer and the pressure raised to from one to three pounds, the wedge-shaped, automatic rubber packing effectually seals the joint against the escape of steam. There is not a bolt or nut to tighten, and the greater the pressure, the tighter the joint.

The points of advantage claimed for this head are a great saving of time, ease of operation and safety. The head is adapted to be applied to the old bolted type of vulcanizing cylinder.

BERTRAMS' ROLL BUFFING MACHINE.

THE accompanying illustration shows a machine designed for buffing and polishing calender and mill rolls, or any other rolls which require a smooth, even finish. On the heavy bed



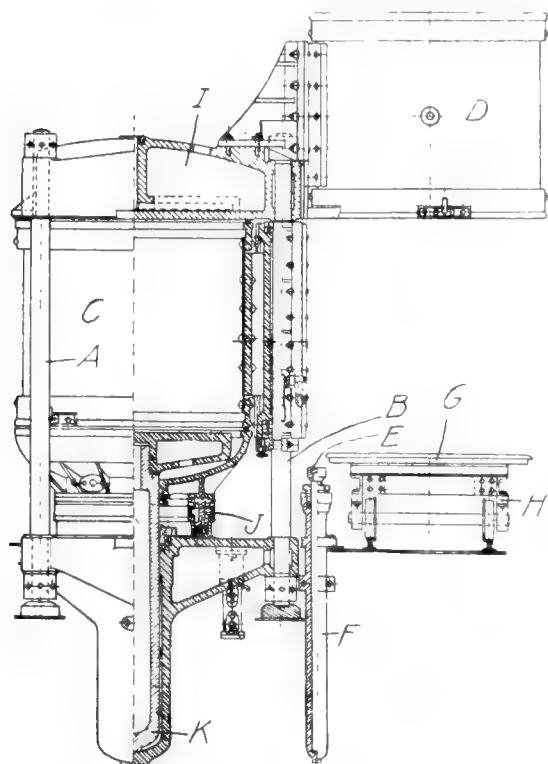
of the machine are V-shaped slides, over which travels the carriage carrying the buffs. The buffs are driven by belts from a

long overhead drum. The roll to be ground or buffed is mounted in heavy bearing brackets above the center line of the bed, and revolves in its own journals. Grinding wheels are arranged on both sides of the roll in the carriage, and are traversed in both directions along the face of the roll, while the latter is revolved at a suitable speed. The overhead drum extends the full length of the machine, and is longer than the longest roll liable to require grinding. The roll is revolved from the driving shaft through two universal joints, and provision is made to compensate for the deflection of the roll so that a perfectly true surface may be obtained. [Bertrams Limited, Sciennes, Edinburgh, Scotland.]

A QUICK-ACTING VULCANIZING PRESS.

THE accompanying drawing shows a somewhat unusual form of vulcanizing press, designed by Paul Beer, of Berlin, Germany. Instead of the usual four steel columns, this press has two columns *A*, at the rear, and a single column *B*, at the front. It has two cylinders *C* and *D*, each of which is provided with gibs arranged to slide vertically on a guide attached to the column *B*. The cylinders may be swung around this column as a pivot, and may be raised or lowered by means of a piston *E* operating in a hydraulic cylinder *F*.

The articles to be vulcanized are placed in molds stacked upon a plate *G* on a truck *H*. The truck is then run under the cylinder *D*, which is open at the bottom and raised as shown. This cylinder is lowered over the molds by means of the piston *E*, and the plate *G* is clamped to it. The cylinder *C* in the press is relieved from steam and hydraulic pressure, and both cylinders are then swung around the column *B* until cylinder *D* is brought into position in the press, and cylinder *C* is directly over the truck. The molds containing the vulcanized goods



BEER'S QUICK ACTING VULCANIZING PRESS.

are then released by unclamping the plate *G*, and the empty cylinder is then raised by means of the piston *E*. While this is being done the press is operated to compress the molds, and to press the cylinder against the head *I* of the press. In order to

press the molds against the head, only a short movement is necessary. For this, a circular, hydraulic ram *J* is employed. It has two concentric movable rings which have wedge-shaped projections arranged so that the piston may be locked in its raised position. This circular, hydraulic press operates independently of the main ram *K*.

The advantage claimed for this type of press is that it can be charged and emptied simultaneously, thus reducing labor and economizing time. Also the ram and cylinder of the main press can be made shorter than usual, since the press operates only to compress the molds.

CONTRABAND OF WAR.

According to National Chamber of Commerce Bulletins issued in August Germany had agreed to follow the decision of the London Conference of 1909 as to the articles absolutely and conditionally contraband. Those articles conditionally contraband are liable to capture only if shown to be destined for armed forces or for government departments. The English regulations are practically the same as those of Germany, except that the German list includes aeroplanes, etc., in the conditionally contraband list while England places them in the absolutely contraband section.

EXTRACT FROM LIST OF LONDON CONFERENCE 1909

Absolutely Contraband.—Distinctively military clothing and equipment. Articles of camp equipment and their distinctive component parts. Aeroplanes, airships, balloons and air craft of all kinds and their distinctive component parts, together with accessories and articles recognizable as intended for use in connection with balloons and air craft.

Conditionally Contraband.—Clothing, fabrics for clothing and boots and shoes, suitable for use in war; vehicles of all kinds, available for use in war and their component parts; materials for telegraphs, wireless telegraphs and telephones.

FRENCH MOTOR CARS AND THE WAR.

According to advices from France, the subsidy scheme which has been carefully developed during the last six years is now proving of benefit to the nation. Uniformity of speed, size, carrying capacity, weight, tire and wheel dimensions have been the principal points kept in view.

There are said to be 70,000 motors with the French troops, 15,000 of which represent subsidized motor trucks, which went automatically into the service on the declaration of war and were immediately moved forward to the German frontier.

Besides calling for the subsidized vehicles, the army authorities have made large purchases of trucks of all kinds. There is in fact a shortage of this class of vehicle in France. The French Government assumed, on August 1, the control of the De Dion-Bouton plant, the workmen all donning soldiers' uniforms.

HOW TO GET GERMAN GOODS TO AMERICA

It is pointed out in the German press that there are perhaps two possibilities of sending goods to America, via Holland (Rotterdam) and via Denmark (Copenhagen). As soon as normal conditions are to some extent restored, and negotiations with the Dutch steam lines are formally concluded, goods will be sent to the Dutch frontier (Bentheim), where they will be taken care of by Dutch shipping agents for shipment via Rotterdam to America. German insurance companies decline the war risk, but it is suggested that Dutch underwriters might undertake it.

Should be on every rubber man's desk—Crude Rubber and Compounding Ingredients; Rubber Country of the World; Rubber Trade Directory of the World.

The India Rubber Trade in Great Britain.

By Our Regular Correspondent.

THE RUBBER TRADE AND THE WAR.

AT the request of the editor, whose unexpected visit to England on the abandonment of his trip to Java has been a source of pleasure to his many friends on this side, I am devoting my space this month to comments on the effects resulting from the European war in which we are engaged. Special matters may conveniently be grouped under their respective headings and the first paragraphs will contain brief references to generalities not elsewhere receiving more detailed notice.

It goes without saying that the trade, more especially the export trade, is considerably disarranged, but in this respect we are by no means in so bad a position as is the case with our enemies and allies. The universal military service existent on the continent has meant many factories being largely depleted of their workers, including the technical and clerical staffs. In Great Britain numbers of men and a limited number of officers have been called from rubber works by the mobilization of the territorial forces, but in no case has the number of men withdrawn from any particular plant led to the stoppage of the works.

The position of affairs among rubber manufacturers generally is that while some firms are working practically round the clock to complete government orders, others, who are not in the list of government contractors, either because they do not make the particular classes of goods required or because of their limited size and status, are feeling the pinch of bad trade very severely. The government orders given out comprise ground sheets to form the tent floor, motor tires for transport wagons and ambulances, bed sheeting, elastic bandages, pure rubber sheet, etc., for hospital use, as well as larger orders for goods on the admiralty list, some of which are supplied to the government dock yards direct and others to the private shipbuilding yards. The goods mentioned above by no means include all which might be enumerated but they will suffice to show the trend of present activity in our large works.

As a set-off to this loss of export trade, we have the fact of short time being general in the cotton trade and in engineering establishments not supplying goods required in war. Again some collieries have closed down temporarily and others are on short time, owing to a decreased demand for coal for industrial purposes, as well as to a shortage of pit props, the arrival of which from Scandinavia has been delayed. The waterproof garment branch seems to be badly hit, houses in the trade working only two or three days a week; though the depression here cannot be attributed entirely to the war as it has been chronic for some time. Even now when certain branches of proofing should be busy from war demands there is great difficulty in getting the particular textile wanted, as owing to bad trade generally many textile mills shut down for a time some weeks ago, and they are not inclined to re-start for transitory orders of what they consider inconsiderable magnitude.

The rubber heel trade of the baser sort has been very decidedly affected, as so much of the business was done with the Continent. I am doubtful if there are any rubber goods, except perhaps rubber sponges, coming from the Continent which cannot be supplied at home. In the matter of hollow balls there is a convention regulating the price. It is understood that contracts with Germany and Austria are void, though opinion on the point is by no means unanimous. Conventions as to prices, however, are a different thing and will probably continue in force. Anyhow,

there is no reason why British makers should seek to raise the price, as rubber is plentiful enough, though one must not overlook possible difficulties in the case of certain chemicals.

A somewhat important article coming from Germany and Austria is the high temperature sheet packing, first produced by Klinger at Budapest and later made by himself at Berlin under the name of Klingerite. There are now several makers of this class of goods on the Continent with whom Turner Bros., of Rochdale, England, are competing with their Permanite. The foreign firms which have depots in England are, of course, in a bad way, as they cannot get supplies. Moreover the general public feeling against the purchase of German goods is such that resumption on the conclusion of hostilities is hardly likely to be attended with success. To enlarge somewhat on this issue it may be mentioned that active steps are being taken by the Board of Trade in conjunction with traders all over the country to devise means whereby the German export of a variety of goods to Great Britain can be more successfully met by home competition. Though a great deal has been written in the daily and technical press with regard to various products I have not noticed any reference to rubber goods, such as electric cable and tires. I propose to revert to this topic on a future occasion at greater length and will only remark that in our enthusiasm to reorganize our business relations with the enemy, it should not be overlooked that we send to Germany every year goods to the value of 100 million sterling.

PERSONALITIES AND THE WAR.

As already mentioned, the ranks of rubber workers have been depleted by the calling out of the Territorials and by those who have enlisted in the new army. Few statistics are available, but it is stated that in the case of the Dunlop Rubber Co. the loss of men from this cause amounts to about one thousand. Perhaps sooner or later some account may be compiled of what the leaders of the industry have done on the lines referred to in the following paragraphs:

Colonel R. K. Birley, C. B., of Charles Macintosh & Co., Limited, retired territorial artillery, has taken over the position of Director of Army Clothing for the East Lancashire Division Territorials.

Lieutenant-Colonel Fallows, of the Leyland & Birmingham Rubber Co., Limited, is in camp with his battalion of the Lancashire Fusiliers Territorials.

Captain J. J. Shannessy, of the Midland Rubber Co., Limited, Birmingham, is in camp with the Royal Warwickshire Regiment Territorials.

Mr. Isidor Frankenburg has contributed £500 to the National Fund for Relieving Distress.

Mr. J. F. Moseley, of David Moseley & Sons, is on the list of special constables for Manchester.

Major Birley, R. A., whose name occurred among the British wounded in France, is a son of Col. R. K. Birley.

RUBBER CHEMICALS AND THE WAR.

Many industries have been crippled owing to the stoppage of chemical supplies from Germany and elsewhere. The rubber trade comes in this category though it has not been affected to anything like the extent experienced in other industries, as it draws comparatively little of its requirements from the Continent. Of the more largely used fillers oxide of zinc has been scarce and has risen in price. The bulk of our supplies comes from Liège, a town which has recently made history. Here the oxide

is produced by the Vieille Montagne Co. by the combustion of metallic zinc. The zinc ore which at one time was largely produced in Belgium now comes mostly from the company's mines in Sardinia, Sweden, England, etc. The principal producers of zinc ore and metal are Germany and America, and a business arrangement to control prices by limitation of output has now for some years been in existence between these countries. As zinc is a constituent of brass its export has been forbidden by the belligerent countries, the present stock in England being under the control of the government. This does not apply to the oxide. French zinc oxide manufacture has made great strides in recent years owing to the anti-white lead agitation, and this oxide has found its way into many rubber works in competition with the Belgian. The production of zinc oxide in the chemical treatment of complex zinc-lead ores is now a large industry in America, but somehow or other the product has not found favor with British rubber manufacturers. The present situation may prove of utility to American interests though, as our present supplies do not come from Germany, I am not disposed to be enthusiastic over America's prospects.

I am in much the same frame of mind with regard to another important rubber chemical, sulphur, to wit, which in the crude form comes to us so largely from Italy, or Sicily to be more definite, a country whose neutrality has meant more to us than has that of America. Unfortunately for the rubber trade sulphur is contraband of war and supplies from Sicily have been seriously delayed, leading to a shortage in England and to a considerable rise in price. America is now, of course, a large producer of sulphur by the Herman Frasch process from underground deposits, and I have heard the topic of American supplies discussed. I believe, however, that the contraband of war difficulty arises here also. All the private gunpowder works in England are now taken over to some extent by the government, and it is hardly likely that rubber works can augment their stocks from this source. A fair quantity of sulphur is produced in England as a by-product from alkali ammonium sulphate and gas works and no doubt this will be drawn upon to a greater extent than is customary in normal times. There are also sulphur deposits in Spain which with some more capital and energy might make more noise in the world than they have done in the past. I may add with regard to sulphur from Sicily that shipments have been vetoed by the Italian government, though the ship owners were quite willing to carry parcels already on board.

With regard to other chemicals the great majority are made in England and the imports from Germany can easily be dispensed with. The requirements in carbonate and oxide of magnesia, for instance, can be easily filled by English makers. It is only close competition from German makers that has led to the by no means large import of the foreign-made article. Again, as regards red sulphide of antimony the original makers of this chemical for the rubber trade are still in business and no doubt the two or three British firms which specialize in this can easily fill all requirements. Barytes has been coming to us from the Continent, but both the carbonate and sulphate are mined in large quantities in the United Kingdom. The litharge which has been coming from Germany can easily be replaced by the home product. Carbon is contraband of war, and I don't know what the position is with regard to the high quality carbon black which comes from abroad, chiefly from America. The heavier vegetable blacks are obtained from British works.

Generally speaking the dependence of the rubber trade upon Germany is very insignificant compared with some other trades, and no stoppage of work need be apprehended. The laboratory will be affected, however, as so many chemicals and a considerable amount of apparatus came from Germany, and the chemical dealers are filling orders very sparingly from stock. There is plenty of rubber available, but as zinc oxide has been fetching £45 per ton no doubt certain goods will be advanced in price.

PROHIBITION OF EXPORTS

By a proclamation of August 5 the exportation of warlike stores from the United Kingdom is prohibited to all ports in Europe and on the Mediterranean and Black Sea, with the exception of the ports of our allies. The list of substances is a long one, but the rubber trade is only directly concerned with the following,—Asbestos, telegraph and telephone cables, articles of camp equipment, vulcanized india rubber sheet, engine and boiler packings and uniform clothing and military equipment. The india rubber sheet no doubt refers to that used by the admiralty, though, of course, military ground sheets would come in this category as well as in that of camp equipment. I have not heard of any case where business has been done contrary to this proclamation, though it is conceivable that errors of judgment might arise through ignorance of what particular goods go to make up camp and military equipment. Under these wide headings no doubt we have riding mackintoshes, "gum" boots, surgical and druggists' goods, cycle and motor tires, aeroplane fabric, etc., etc. Though Spain is not among our allies, the prohibition is not extended to its ports, so that if desired business in the above goods may be done with that country.

In addition to the above proclamation another one has been issued having reference to trading with the enemy, any new transactions being prohibited. Some orders from Germany which came in during August were promptly refused by British firms, though some little difficulty has been experienced in finding out whether orders from Holland are really intended for Germany. With regard to reclaimed rubber, in normal times we export a good deal to Germany but take very little from her, while a good deal of reclaimed comes from Russia and France. The general position is that while the export business for our reclaimers has declined or, more accurately, vanished, the home business has increased owing to the failure of foreign competition from the Continent.

INCREASED USES OF RUBBER.

Among the principal objects of study by rubber specialists in the earlier part of this year were various schemes for the extended utilization of rubber. Prominent among these was the plan of Messrs. Dessau and Morrison, of London, for the laying of rubber pavement, with a view to eliminating the noise of city traffic. Previous to the commencement of the present hostilities an English patent was secured for the system in question.

Under the auspices of the Rubber Growers' Association of London a company was formed with a proposed capital of \$150,000 for the purpose of exploiting this patent on the basis of plantation companies participating in the venture. It was proposed for them to furnish annually without charge during five years one-fifth of one per cent. of their output, in addition to a like further quantity at one shilling a pound. An aggregate output of 20,000 tons a year would have been sufficient to supply 40 tons free and 40 tons at the price named.

The financial situation has been changed by recent events, but the project will doubtless be taken up again later.

EXPECTED ADVANCE IN ENGLISH FACTORY PROPERTY.

Active measures are being taken by many English manufacturers to prepare for increased trade owing to the disturbed conditions on the continent. The fact is being recalled that the passing in 1907 of the English Patent and Designs Act was followed by marked activity in factory property, and similar conditions are anticipated as a result of the present complications. Reports from England state that firms in many branches of trade there are seeking factories in which to establish industries, from the operation of which they have in the past been excluded by the low quotations of foreign manufacturers.

THE BRITISH CENSUS OF PRODUCTION, 1907.

WHILE the report of the British Census of Production for 1907 has only recently appeared, its compilation has evidently involved considerable effort. Although modeled in a general way upon the American Census of Manufactures (which has been taken for 1899, 1904 and 1909), it is far more detailed. This is particularly the case with the rubber industry, in which the accessory trades have been separately shown; the items of "Miscellaneous Rubber Goods" and "Other Products" being of relatively small importance.

The total product of rubber goods made in British factories in 1907 is shown in Table A as equal to about 47 million dollars. To this amount should be added 34 million dollars, shown in Table B, for the production of nine industries reported separately as using some rubber, but which has not been segregated. The British production of rubber goods in 1907 was thus the equivalent of 80 million dollars, as compared with the reports of the United States Census of 1909, quoted by THE INDIA RUBBER WORLD in May 1912 (page 374), of 200 million for rubber industries, and about 125 million for accessory industries using more or less rubber.

It is of course probable that the amounts of production have since increased on both sides of the Atlantic, but the figures for 1909 and 1907 afford a basis of comparison.

COST OF PRODUCTION.

The cost of materials is shown, in respect to Table A, on a product of about 45 million dollars, as approximately 29½ million. This result equals about 66 per cent. on the value of output, or about 5 per cent. more than the average shown by the United States census of the rubber industry for 1909. The cost of material for the product of elastic webbing was about 60 per cent. of the value.

PERSONS EMPLOYED AND POWER USED.

In the various branches of industry shown in Table A, there were 21,556 wage earners and 2,483 salaried persons, making a total of 24,039. Of this number 23,424 were employed in factories with their own engines and 615 in workshops not using power. The power used by the former number represented 27,440 horsepower, distributed as follows: Reciprocating steam engines, 26,423; internal combustion engines, 951; water power, 42; other power, 24; total, 27,440 horsepower. The capacity of dynamos driven by reciprocating steam engines was 4,415 kilowatts and by other power 37 kilowatts, making an aggregate of 4,452. The amount of electricity purchased by the establishments whose product is shown in Table A was 613,000 Board of Trade units.

Altho in various instances the returns are not full in their details, the idea has been to make them of a more or less general character for the United Kingdom as a whole, so as to avoid the possible disclosure of particulars regarding certain firms.

Table A—British Production of Rubber Goods, 1907.

	Value in Dollars.
Waste and reclaimed rubber.....	\$685,000
Rubber compounds and solution.....	255,000
Rubber substitutes	270,000
Solid and insertion sheet rubber (including all articles for mechanical and industrial purposes).....	7,690,000
Machinery belting (including balata).....	680,000
Hose and tubing of rubber, with or without other materials	2,670,000
Engine packings	170,000
Pneumatic tires	11,490,000
Solid tires	2,680,000
Elastic thread, cord, etc.....	2,230,000

Waterproof piece goods, garments, boots, etc., not separately distinguished	6,575,000
Waterproof garments	3,620,000
Rainproof garments	230,000
Rubber heels	1,570,000
Golf and tennis balls and sports requisites, etc....	2,365,000
Hot water and air goods; medical, surgical and dental appliances	905,000
Miscellaneous rubber goods.....	2,835,000
Other products	450,000

Total of rubber manufactures.....\$47,370,000

Table B—Production of Goods Made Partly of Rubber, 1907.

ELASTIC WEBBING:

Braids and cords.....	\$3,315,000
Suspenders, belts, stockings, etc....	690,000
Other textile manufactures.....	360,000
	<hr/> \$4,365,000

ELECTRIC POWER AND LIGHTING CABLES:

Rubber insulation	6,500,000
Paper and bitumen insulation (some rubber used)	6,610,000
Other insulation (some rubber used)	3,645,000
	<hr/> 16,755,000

TELEGRAPH AND TELEPHONE CABLES:

Submarine	5,510,000
Land	4,045,000
	<hr/> 9,555,000

Waterproof apparel	1,475,000
Druggists' sundries	610,000
Rubber stamps and accessories.....	150,000
Reservoir pens and stylographs.....	270,000
Rubber manufactures produced by engineering and cycle firms	600,000

Total of goods partly of rubber.....\$33,780,000

BRITISH ELECTRICAL INVESTMENTS.

A table published in the last (eighteenth) edition of "Garcke's Manual of Electrical Undertakings" illustrates the development of English electrical investments during the last seventeen years. In 1896 there were 200 concerns, with an aggregate capitalization equaling about \$300,000,000; while the number of undertakings now reported on is about 3,000. The total capital outstanding in 1913-14 is said to represent about \$2,100,000,000 or seven times the amount in 1896. In both cases the figures include shares, debentures and loans, together with the borrowings of municipalities for electrical undertakings, but do not include the value of the government telegraphs.

HERMANN MÜLLER & CO. CHANGE TITLE.

Hermann Müller, of the crude rubber firm of Hermann Müller & Co., 21 Mincing Lane, London, was granted permission on August 25 to change his name to Harvey Christie-Miller, and a similar change has been made in the firm name, which is now Harvey Christie-Miller & Co.

The Dunlop Rubber Co., Ltd., of London, has declared the usual quarterly dividend on its 6 per cent. cumulative preferred shares.

The Sirdar Rubber Co., of London, has introduced a new non-skid tire in which the metal studs are flush with the tread, in zig-zag depressions in the rubber. The claim is made that a tire of this class, without the additional protector, needs less inflation and allows greater resiliency.

Some Rubber Interests in Europe.

THE LATE MR. JOSEPH FRASER.

THE funeral took place at Allendale Cemetery, Aberdeen, Scotland, on September 1, of Mr. Joseph Fraser, aged 62, long a prominent figure in the Ceylon planting community. His original experience had been in the application of fertilizers to tea, the large increase of yield per acre of late years having been largely due to his individual efforts. Subsequently he interested himself in rubber cultivation, in connection with which he repeated the successful results he had achieved with tea. Mr. Fraser was a director in fifteen companies operating in rubber, tea, coffee and coconut cultivation, including some of the most successful plantation concerns.

MR. C. A. LAMPARD ON SYNTHETIC RUBBER.

The ever-recurring subject of synthetic rubber was dealt with by Mr. C. A. Lampard at the recent meeting of the Rubber Plantations Investment Trust, Limited. He quoted the recent statement of an eminent rubber chemist to the effect that both of them would be in Heaven, or elsewhere, before the question assumed a practical shape. Mr. Lampard had taken up the position that as a commercial proposition it was impossible on the basis of cost. He likewise remarked that there was a distinct decrease in the receipts of the lower grades of wild rubber.

CONTINENTAL TIRES AND ENGLISH CUSTOMERS.

Soon after the declaration of war the Prowodnik Co. was obliged to call in its stock of goods in England. The tire made by this Russian company had made some headway in the British market during the last year.

The war has interfered with the receipt of new supplies by the Michelin English depot, but a fair business is reported by that company and other concerns in sales from stock. Owing to the partial stoppage of its French factory, the Hutchinson Co. has been unable to obtain further supplies from that quarter. They report having a supply of tires on hand sufficient for half a year's trade. Two of the directors are with the French army.

German tire manufacturers have been gradually depleting their English stocks. Disputes have arisen with some English customers as to the validity of their contracts with foreign houses, they claiming that their engagements are cancelled by the declaration of war. These discussions have been in most cases settled by the acceptance of the goods.

The Pirelli Co., of Milan, is in the fortunate position of having a good stock in London, while its manufacturing facilities are about to be increased by the opening of its new cable works at Southampton.

AFRICAN RUBBER IN THE LONDON MARKET.

The following information regarding the recent sales in African rubbers in the London market, has been sent to us by one of the prominent London rubber dealers.

"The African market here has been fairly steady during August and the beginning of September, 55 tons being sold during August and up to September 4. Assinee sheets and Strings were sold at 2s. [48.65 cents] per pound, *Elobes* Ball at 1s. 3d. [30.41 cents] per pound, Selected Gold Coast Lump at 1s. 1d. [26.35 cents] per pound, *Niger Gutta* at 9d. [18 cents] per pound, and *Accra Paste* at 8½d. [17.50 to 18 cents] per pound. Nine tons of *Lahon Cake* was taken up by a dealer here last week at 1s. 7½d. [39.53 cents] per pound, which had been in store for some considerable time. The reported destination was Russia. There is at present very little rubber offering in the African market, only two or three small parcels of old Benin and Lagos Lumps being offered, for which 1s. 3d. [30.41 cents]@1s. 4d. [32.43 cents] per pound, is asked. Heilbut's bid of 1s. 2½d. [29.39 cents] for 5 tons was refused.

LONDON AUGUST RUBBER STATISTICS.

London rubber imports for the eight months ended August 31 showed an increase as compared with last year from 19,699 to 27,274 tons, while the last two months exhibited a falling off from 3,418 tons in July to 3,091 in August. The last figures are chiefly of interest, because there is usually an increase of quantity at that period. Deliveries had, however, likewise fallen back from 3,225 tons in July to 2,810 tons in August, or to a somewhat larger extent than receipts. Meanwhile the total deliveries for eight months had grown from 18,723 tons a year ago to 26,972 tons, being in a larger proportion than the receipts. The London plantation stock had risen from 3,242 tons at the end of July to 3,523 at the end of August. The last named figure is said to be the largest since April last.

RUBBER GOODS OPENING IN ITALY.

In a report on the commercial conditions in Venetia, Consul James Vernor Long, stationed at Venice, states that football and lawn tennis, as well as other outdoor sports, are largely indulged in in that locality and that if American manufacturers could compete with the prices of other foreign houses and would give credit to dealers, they might find an opening for athletic accessories in the Italian market. He also believes there is an opening for the sale of rubber bedding for use in the hospitals on *Sacca Sessola* and *La Grazia* Islands.

The import duty is high, however, being \$15 per hundred pounds, and prices must meet those of the Italian articles in order to compete. Samples submitted should be accompanied by quotations which include all charges, in Italian currency, and measurements based on the metric system.

TRADE OPENINGS IN AUSTRALIA.

The opening of the Panama Canal and the war afford opportunities to American exporters for the extension of their Australian trade. In 1903 Australian imports of American merchandise amounted to \$28,886,278, of which \$24,347,732 was imported direct. The total imports from the United States in 1912 were \$52,384,257, of which \$45,986,239 went direct from American ports.

In 1912 Australia imported rubber manufactures to the amount of \$4,840,951, of which the United States only supplied \$551,832.

RUSSIAN RUBBER EXPORTS TO THE UNITED STATES.

Reports from the various American Consular Offices in Russia show the following exports from that country to the United States during the last two years:

	1912	1913
Balloons .....	.....	\$2,110
Reclaimed rubber	\$26,347	536,974
Shoes .....	.....	14,164
Sponges	8,446	8,548
Tires	20,977	78,367
Waste	510,846	242,722

Reports from the Odessa consular district state that American automobiles are becoming popular in southern Russia, where about 500 cars were sold in 1913, most of them at prices from \$1,288 to \$2,318. Sixty American cars were registered last year in the city of Odessa, where seventy-five cars were sold during the year.

Should be on every rubber man's desk—Crude Rubber and Compounding Ingredients; Rubber Country of the Amazon; Rubber Trade Directory of the World.

A FRENCH PROCESS FOR RECLAIMING FABRIC IMPREGNATED WITH CAOUTCHOUC.

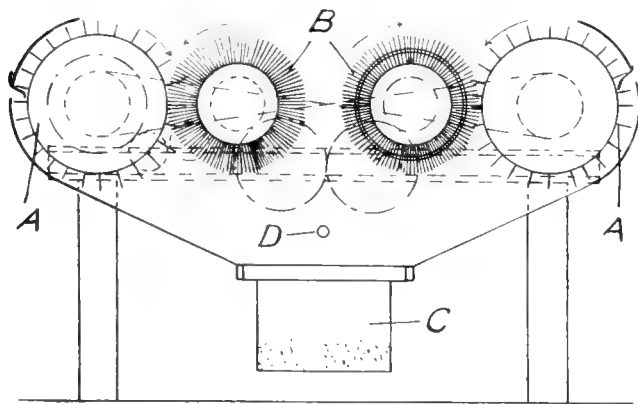
WHILE this country has led the world in the matter of reclaiming rubber, little attention has been paid to reclaiming fabric which may be impregnated with caoutchouc. As an example of this may be mentioned the fabric in which tires are wrapped while vulcanizing, which fabric becomes impregnated with vulcanized rubber, but does not contain enough to make the rubber of importance rather than the fabric.

According to French patent No. 460,273, the fabric may be recovered by taking advantage of the properties of certain solvents to greatly swell the vulcanized rubber and thus loosen it from the fabric. The solvent mentioned as suitable is xylol, in which the fabric is soaked for two or three days.

Xylol is a constituent of coal tar and is recovered with the benzol, but its price is beyond reach for any such purpose as this as it sells for over a dollar a gallon and is now unobtainable, while even before the disturbance of the chemical market it was very scarce and in great demand. There are many other like solvents, however, that might be used. Coal tar oils and naphtha, turpentine, pine oil, and in fact all the rubber solvents possess this property, as is well known. C. O. Weber recommended naphthalene nitrate or nitro-naphthalene as a solvent for rubber in analytical work and this would probably be effective here. The idea is to get the cured rubber loosened if not dissolved from the fabric.

When this swelling has taken place and loosening is effected there are several ways of procedure given to separate the rubber and fabric. If there is considerable rubber it may be broken from the fabric. There still remains the rubber on the surface or which has been frictioned into the fabric itself. To free the fabric it is brushed preferably with metallic brushes, and for this purpose the machine shown in the accompanying illustration is used.

The fabric is fed into the machine from either end, between a spiked holding roll *A* and a metallic brush *B*. The brushes revolve at a higher speed than the spiked rollers and loosen the



rubber from the fabric. The finely divided rubber falls into a receptacle *C*, while the solvent vapors are drawn off by an exhaust fan through a pipe *D*, and subsequently recovered by condensation.

It is said that by the application of a water soluble solvent for the xylol, such as acetone, that the rubber will be reduced to powder and the xylol thus recovered. It is evident that if the acetone were in turn removed with water it would tend to further disintegrate the rubber, or if steam were introduced to distil off the acetone the same result could be accomplished.

Considerable stress is laid on the value of the recovered rubber powder, though experience convinces that this would not amount to much, but the profits of the operation would be from the recovery of the fabric if not entirely free from the

rubber stains, at least clean enough for re-use as vulcanizing cloth or tape.

This is a subject which may be of interest to some of the large consumers of fabric for the above purpose, as it cuts down costs a little by conserving the raw materials of manufacture; and even a slight saving is important in the present fierce competition, which results in the cutting of prices down in some cases to bare production costs.

RECENT STATUS OF THE GERMAN INSULATED WIRE INDUSTRY.

PRACTICALLY all manufacturing industries in Germany, including the different branches of rubber manufacture, are, for the time being, of course absolutely paralyzed, and it is impossible to tell how long this paralysis will continue or how complete the ultimate recovery will be. This makes it all the more interesting to review the conditions in any line of rubber manufacturing as they existed just prior to the outbreak of the war.

As an accessory branch of the rubber manufacturing industry, the manufacture of electric wire has been subject in Germany to similar influences. Its development has been to a certain extent simultaneous with that of the rubber industry, properly so-called.

Germany has displayed a marked advance in the production and export of insulated wire. The exports for the last eight years have been as follows:

EXPORTS OF WIRE COMPOSED OF BASE METAL, COVERED, WOUND, SPUN OR PLAITED: WITH SPUN THREADS IN CONJUNCTION WITH INDIA RUBBER OR GUTTA PERCHA:

	Tons.	Value Equaling.
1906	1,801	\$2,026,500
1907	2,192	2,716,000
1908	2,320	1,865,000
1909	2,570	1,573,750
1910	3,360	2,057,000
1911	4,731	2,892,250
1912	7,115	4,322,500
1913	8,394	5,430,250

The figures of 1912 and 1913 include wire with other insulation than india rubber or gutta percha, the amount of which is understood not to have been large. The fluctuations in value in 1908 and 1909 are regarded as due to the crisis of 1907 and its after effects.

The total German export of insulated wire for 1913 thus represented more than \$5,000,000, a similar quantity being absorbed by the German market. This aggregate output, exceeding in value the equivalent of \$10,000,000, was the production of 25 factories, some large and others small. As in other branches of the rubber industry, augmented consumption led to increased production, thereby inducing keen competition.

Under these circumstances, the natural result was the reduction of qualities, efforts having been specially directed toward economies in the various compounds. The results of such a policy aroused criticism; and not only was the reputation of German insulated wire assailed but also that of the German electro-technical industry generally. There was no way of economizing in the copper conductors. In fact, the situation of the copper market would have warranted an advance, a like condition prevailing as to cotton. Moreover, by reason of the existing socialistic tendencies, demands for higher wages were naturally to be expected. Compounds, the rubber in which was exclusively regenerated, or with a rubber content as low as 8 per cent, were by no means rare. Hence, if the entire insulated wire industry was to be prevented from falling into discredit, a change was unavoidable.

At this juncture the Association of German Electrical Engineers prescribed a definite composition for rubber com-

pounds. In these efforts the association had the support of the more important factories, while in conjunction with the Royal Material Testing Bureau, the manufacturers formed a technical organization for testing the qualities of the products in co-operation with the buyers. The result was that, when not otherwise stipulated, all wire coming on the market fulfilled the requirements of the German Association of Electrical Engineers.

This settlement of the technical question involved did not, however, work in practice. While the "Normal Compound" was to contain 33.3 per cent. of crude rubber, with a proportion of resin not exceeding 6 per cent., it was only stipulated as to added substances that not more than 3 per cent. of their aggregate contents should consist of ceresine. In this respect there was perfect freedom accorded the manufacturers, so that some low-grade compounds were produced, of which one containing 34 per cent. crude rubber, 2 per cent. sulphur, 2.5 per cent. ceresine, and 61.5 per cent. chalk, was not the worst. Prices dropped two years ago to a level without profit or even showing a loss.

A combination was then formed by several concerns, operating with extreme caution, so as not to attract competition by excessively high prices. Moreover, the fact was recognized that a specially large investment of capital is not required for establishing a plant of this description. Prices were therefore fixed on a scale which only included a modest profit for manufacturers. The idea was further developed in the fall of 1913 by the establishment of a syndicate, in the form of the "Selling Bureau of the United Manufacturers of Insulated Wire." This syndicate had to arrange the prices so as to cover the profits of the dealers, power plants and installation firms (which are all under heavy expense), in addition to a manufacturer's profit of about 10 per cent.

When it came out with its prices the syndicate soon found the effect of foreign competition. It was realized that the foreign manufacturer with an import duty amounting only 5 per cent. could underbid the German maker who was looking for a profit of 10 per cent. These conditions were to some extent due to the expressions of the German electrical engineers, when the tariff of 1906 was in preparation, to the effect that they wanted no protection, the German industry being, in their view, so well fortified that it was not threatened by any danger from abroad.

Meanwhile the establishment of factories outside the syndicate increased the competition, as various of the existing large rubber factories took up insulated wire.

Under these circumstances, it was reported, even before the outbreak of the European war, that the syndicate, in spite of its good intentions and cautious plan of operation, would be obliged to consider the question of dissolution on its expiry next December.

THE GERMAN EMPIRE AND ITS COLONIES.

AS will be recalled, the German Empire proper consists of twenty-five states with a total of 208,780 square miles and a population in the aggregate of 64,923,993. Of these the most important are:

	Square Miles	Population.
Prussia	134,616	40,165,219
Bavaria	29,292	6,887,291
Württemberg	7,534	2,437,574
Baden	5,823	2,142,833
Kingdom of Saxony	5,789	4,800,000
Hesse	2,966	1,282,051
Hamburg	100	1,014,064
Alsace-Lorraine	5,604	1,874,014
Total of eight principal states	191,784	60,610,307
Remaining seventeen states.....	16,996	4,313,686
Grand total	208,780	64,923,993

Out of the above grand total 28,092,117 persons were, according to the last census (that of 1907), engaged in the following callings:

Agriculture, cattle rearing, etc.	9,732,472
Forestry, hunting and fishing.....	150,785
Mining, metal works and other industries.....	11,256,254
Commerce and trade.....	3,477,626
Domestic and other service	1,736,450
Professions	1,738,530

Total in various callings

28,092,117

The remaining population of about 36 millions was composed of next-of-kin, without principal occupation and without income.

GERMAN IMPORTS AND EXPORTS.

The following table represents the German imports and exports for the last six years:

	Imports	Exports
1908	\$2,019,273,250	\$1,620,374,500
1909	2,215,102,500	1,714,673,250
1910	2,327,498,000	1,911,104,950
1911	2,501,736,250	2,056,095,000
1912	2,754,283,000	2,274,882,250
1913.....	2,673,750,000	2,478,150,000

GERMAN COLONIES AND DEPENDENCIES.

As compared with the area of the German Empire, 208,780 square miles, the colonies and dependencies of that country occupy, it is estimated, 1,027,820 square miles. Scattered over this wide extent of territory are about 24,389 whites and 12,041,003 natives. Thus there is about five times the area with about one-fifth of the population, of which only a small proportion consists of whites.

In 1912 German imports from its colonies equalled \$13,225,000 while German exports to the colonies represented the equivalent of \$14,325,000. During the same year Great Britain's imports from the same source were equal to \$2,954,995 and exports to that quarter \$3,477,105.

German colonies are located in Africa, Asia and in the Pacific, according to annexed table:

STATISTICS OF GERMAN COLONIES.

	Estimated Area	Population
	Square Miles	
Africa.....	33,700	1,632,346
Togo	191,130	2,500,594
Kamerun	384,180	7,651,106
German East Africa.....	322,450	9,438,000
German South West Africa.....	931,460	11,428,429
Total African possessions.....		
Asia.....	200	168,000
Kiauchau		
In the Pacific—		
GERMAN NEW GUINEA:		
Kaiser Wilhelm's Land.....	70,000	
Bismarck Archipelago.....	20,000	
Caroline Islands	500	601,427
Palau or Peleu Island	250	
Marianne Islands	4,200	
Solomon Islands	150	
Marshall Islands, etc.		
SAMOA ISLANDS:		
Savaii	600	
Upolu	340	35,136
Total Pacific possessions.....	96,100	636,563

	SUMMARY	
Africa.....	931,460	11,428,429
Asia	200	168,000
Pacific	96,100	636,563

Grand total

1,027,820

The proportion of white population in the three divisions is: Africa, 22,405; Asia, none shown; Pacific, 1,984.

In area the German colonial possessions are about one-fifth of the United States.

Some Rubber Planting Notes.

CEYLON CONSOLIDATED RUBBER ESTATES, LIMITED.

ACCORDING to details submitted for the year ended March 31, 1914, there were in the above estates 1,166 acres in cultivation, on which there are 142,731 Para rubber trees, above one half of which will be in bearing this season. In addition there were approximately 200,000 Ceara trees, now tappable. More trees are coming into bearing than the estimate for 1914-15 was based on. The visiting agent's report gave an estimate for 1914-15 of 48,250 pounds of Para, being 100 per cent. over the original estimate, while he believed he could get 20,000 pounds of Ceara rubber in six months' time. Up to March 31, 1914, a year's crop of 18,000 pounds dry rubber had realized 2s 1d (50.68 cents) per pound.

PROSPECTS OF PLANTATION RUBBER INDUSTRY.

In discussing the above subject the "Home and Colonial Mail" of London remarks that the outlook for the plantation rubber industry is very reassuring, although there is considerable uncertainty as to the future of crude rubber generally. In the first place, Para business, on account of its close relations with London finance, will be seriously crippled by the war. Then African trade, largely in Belgian hands, is normally centered in the Antwerp market, at present a negligible quantity. Again, there is the difficulty to be anticipated by planters in financing their crops, notwithstanding the measures taken by the Straits government and the readiness of Ceylon bankers to finance the rubber of their own trading community. A certain curtailment of supplies must therefore be looked for.

The question is then: will there be a corresponding restriction in consumption? On this subject it is remarked:

"This is a difficult question to answer. Fortunately, however, for the rubber industry, the chief center of manufacture is a country far removed from and not directly concerned in the war. America consumes roughly one-half of the total world's production of rubber and for the present that country, together with ourselves, Italy and Japan will have to meet the demand for manufactured goods for the entire world. With the main source of supply under British control, there should be little difficulty in keeping both sides of the industry going with advantage to ourselves."

GROWTH AND QUALITY OF COCHIN CHINA RUBBER.

The last issue of the "Annals of Indo-China Rubber Planters" states that it is generally admitted that Sumatra is the country in the Far East where *Hevea Brasiliensis* grows most rapidly. The Malayan Peninsula holds second place, while several authorities give Cochin China a rank equal to Java and far in advance of Ceylon.

In the opinion of Mr. H. N. Ridley, formerly director of gardens and forests in the Straits Settlements, Cochin China is six months behind Malaya, but this disadvantage is offset by the complete absence of diseases in the former country. While admitting this backwardness in young trees, the "Annals" urges that trees seven to eight years old, though still in relatively limited number, are of the same height and circumference as those of neighboring countries. Even in the opinion of foreign experts *Hevea Brasiliensis* has a normal growth in Cochin China and its yield in dry rubber is of excellent quality. Moreover, the product of the Belland and Suzannah plantations sells in Paris on a par with first latex.

A further proof of the character of Cochin China rubber is contained in the fact that at the Ghent Universal Exhibition of 1913 a prize was awarded for the collective exhibit of that country, including rubber from the Ong-yem (Government), Phu-Nhuan (Belland), Suzannah and Natrach plantations.

POSTPONEMENT OF THE BATAVIA RUBBER EXHIBITION.

In consequence of the European complications, the Rubber Exhibition at Batavia, Java, has been postponed. It had originally been scheduled to open on September 7.

PROPOSED NEW RUBBER TESTING STATION FOR WEST JAVA.

Advices from Bandung report that a meeting of important planters has been held there, with the object of establishing a new rubber testing station for West Java at Lampongs. Considerable interest has been manifested in the project and confidence expressed in the prospects of its success.

PONTIANAK RUBBER COMPANY'S SHIPMENT SEIZED.

At the recent London meeting of the Pontianak Rubber Co. Mr. L. Davidson, who presided, stated that the directors were passing through an anxious time on account of the war. Their last consignment had been despatched to London by a German ship, which was seized by the Belgians at Antwerp. Representations had been made to the authorities at that port, which, it was hoped, would result in the liberation of the shipment.

SUMATRA CONSOLIDATED RUBBER PAYS FINAL DIVIDEND FOR 1913-14.

At the meeting on August 10 of the Sumatra Consolidated Rubber Estates, Limited, the directors were authorized to pay the final dividend for 1913-14 on a date to be fixed at their discretion. In sending the warrants at the close of the month it was stated that they were enabled to take this course as the company's business had then resumed more normal conditions.

COLOMBO AND THE WAR.

During the cessation of the Colombo weekly tea and rubber auctions fairly extensive private sales were effected, in which reasonably good prices were obtained, there being, however, more demand for tea than for rubber.

The absence of competition and the cost of war risk insurance in other than British bottoms have increased the demand for space on board English vessels. On account of the extra charges thus incurred, many shippers have been more than usually cautious, and as a result a quantity of rubber is said to be still held back.

FINANCING OF NETHERLANDS INDIES PLANTATION SHIPMENTS.

It is reported that the Dutch authorities in the East have made arrangements for securing the local banks in Java and Sumatra for the advances they contemplate making to facilitate shipments of rubber. Advances up to 9d. (18.24 cents American currency) per pound for rubber produced on the estates will be guaranteed. Advances on title deeds are likewise guaranteed, restrictions as to mortgages in Sumatra having been removed. Estates compelled to reduce expenses will be assisted in sending their coolies back to their respective countries. The opinion entertained in London is that the arrangements made will enable all properly managed and soundly financed estates to weather the storm.

BAMBRAKELLY (CEYLON) TEA AND RUBBER CO., LIMITED.

This company has increased its yield of rubber from 16,540 pounds in 1910-11 to 133,955 in 1913-14 (from 765 acres), the estimate for 1914-15 being 165,000 pounds. With a cost f. o. b. of about 1s. 5d. (34.46 cents) per pound, and a net average realized of about 2s. 2¾d. (54.22 cents) per pound, a dividend for the year ending March 31 of 8 per cent. has been declared.

An interesting feature of the report received is an adhesive label attached to the cover with the following request: "When ordering motor tires, hot water bottles, tennis shoes, garden hose and other goods made from rubber, please make a point of stating that you wish them to be of plantation rubber."

This request is part of the campaign being conducted by the companies on behalf of plantation rubber.

RUBBER AND COCOANUT PLANTING IN MALAYA.

STATISTICS for 1912 and 1913, reported by Mr. Lewton-Brain, Director of Agriculture, Federated Malay States, show an increased acreage under rubber of about 10 per cent., and an area one-third higher than before in cocoanuts. The exact figures are:

ACREAGE IN FEDERATED MALAY STATES

	1912.	1913.
Rubber	399,197	433,324
Cocoanuts	30,308	40,175
Coffee	8,669	7,995
Other cultivation	3,068	4,133

The preponderance and growing importance of rubber in the Federated Malay States is thus illustrated. Coffee and sugar planting show a decline, the latter having practically gone out in various districts.

While the above table deals with the Federated Malay States alone, another return for the whole of the Malayan peninsula is of special interest.

STATISTICS OF MALAYA

	1912.	1913.
Estates	1,055	1,151
Acreage in possession.....	1,498,282	1,622,231
Acreage planted	621,621	708,545
Rubber alone	587,874	682,613
Rubber interplanted with catch-crops..	33,748	25,932
Acreage producing	165,566	213,459
Planted during year.....	85,903	86,924
Output	18,956.8 tons	28,169.16

STATISTICS OF MALAYAN PENINSULA, 1913.

	Acres Planted.	Output. Tons.
Federated Malay States.....	433,324	21,229.17
Straits Settlements	111,316	6,047.14
Johore	117,022	1,645.70
Kelantan and Kedah.....	45,373	246.18
Trengganu	1,510	not yet producing
Total	708,545	29,168.19

ESTATE LABOR.

The total number of laborers in 1913 was 282,354, as compared with 255,912 in 1912. Of the later year's number nearly 75 per cent. were employed in the Federated Malay States, the remaining 25 per cent. being distributed through the other parts of the peninsula.

RUBBER IN JAMAICA.

While dealing with the various other agricultural features of the island, the annual report of the Department of Agriculture, Jamaica, for the year ending March 31, 1914, contains several references to the cultivation of rubber. Jamaica, as will be recalled, has an area of 4,200 square miles, and the most successful variety of rubber for cultivation has been *Castilloa*. The distribution of plants for three successive years has been: 1911-12, 22,745; 1912-13, 5,878; 1913-14, 2,667. Most of these plants went to small settlers, with whom their growth has been satisfactory, but owing to the drop in the price of rubber from 12s. per pound in 1910 its present value of about 2s., the opinion is expressed that few crops are at present raised in Jamaica with so meagre a financial return as that indicated for *Castilloa* rubber. Tapping of eight-year old *Hevea* was unsatisfactory and is said to have confirmed the view that *Hevea Brasiliensis* is not suitable for commercial cultivation in Jamaica, where any capital invested would have been lost.

Virgin rubber (*Sapium tolimense* Kunth), owing to the length of time required to ripen, seems to have given results of a disappointing character.

The reports of the various public gardens in Jamaica constitute a feature of interest, as showing the progress being made in various forms of agriculture in the island.

EASTERN AND WESTERN AGRICULTURAL COLLEGES.

The claims of Ceylon as the site of the proposed Imperial Agricultural College have been urged by Lord Curzon, Governor both in the colony and at home. At the recent conference of Tropical Agriculture the choice of Ceylon was advocated by Professor William R. Dunstan. In this connection the report attaches to a paper prepared for that occasion by Mr. J. H. Smith, the editor of "Tropical Life," in which he refers to his suggestion of April, 1913, for two colleges to cost £10,000 each, three at £75,000 or four at £55,000 each. The aggregate cost of these colleges, Mr. Smith estimated would not exceed 10 per cent. of that represented by a Dreaming Machine. Taking Professor Dunstan's later estimate of £50,000 as the prospective outlay for a Ceylon college the writer remarked that it should be duplicated in the West, where he advocated the establishment of another college in the West Indies.

Such an institution, it was added, could train men to go to West Africa to take up the Imperial work of forestry, as had been done with men trained at Trinidad who were better able to cope with local African conditions than if their education had been in the East.

At the same time Mr. Smith advocated sending to the East those embryo planters who were looking towards that quarter of the globe, adding:

"I am not urging the claim of the West Indies in competition with Ceylon. . . . On the contrary, if *pro tem*, there is to be only one college, then I agree that Ceylon should have it, but . . . our welfare as a trading nation . . . renders it quite as important that we should establish a college in the Western hemisphere as it is that we should have one in the East."

TRADE OF GERMAN EAST AFRICA.

The imports of German East Africa during the four years 1909 to 1912 equaled, respectively, \$8,078,125, \$9,200,790, \$10,920,790 and \$11,973,580, the trade being chiefly with Zanzibar and Germany. Exports principally consisted of rubber, copra, ivory and sisal; the amounts for the respective years representing \$3,122,435, \$4,951,685, \$5,340,185 and \$7,478,575.

According to the report of the Department of Commerce and Labor of February 28 last, wild and plantation rubber together occupy the leading position in the exports of the colony, the production of the former kind tending to decrease while the latter is rapidly growing in importance, having been taken up on a large scale by Europeans in the Kilimaniaro district west of Dar-es-Salaam and in the southern coastal area.

While *Kickxia*, *Castilloa*, *Hevea* and *Ficus* have been tried, the greatest success has been with *Manihot Glaziovii*. Exports of all kinds of rubber increased from 531,460 pounds, valued at \$264,910, in 1908, to 2,653,035 pounds, valued at \$2,005,436, in 1912. These figures indicate an increased production of the more valuable plantation variety of rubber.

The report of the British Consul at Dar-es-Salaam speaks of the setback which the rubber industry had experienced through the fall in prices which occurred in 1913, there being probably 19,000,000 trees planted in the colony of which about half were ready for tapping. Efforts have been made to meet the situation by the reduction of railway and ocean freights as well as by the abolition of import duty on the acids used in coagulating rubber.

By the latest accounts a slight improvement in the value of rubber had led, prior to the outbreak of the war, to the resumption of tapping by some planters. The German Colonial Economic Committee had been taking steps to introduce a standard quality of East African rubber, the absence of which has impeded the operations of planters. It is added that there is only one large washing and curing factory in the colony, at Muhesa, though several smaller ones exist at Usambara, the planters being obliged to wash the rubber themselves. This fact requires it to be again washed in Europe.

NOTES FROM BRITISH GUIANA.

By Our Regular Correspondent

WONDERFUL WEATHER UNPRECEDENTED YIELD IN BALATA EXPECTED

THE weather for August and September has been most remarkable. The rainy season is apparently not yet at an end, for plentiful and vigorous showers are still falling, and after some years of drought it will be understood how very welcome this state of affairs is, when it is stated that ordinarily the rainy season is at an end by the first of August. In the dry months the balata trees refuse to yield any latex, so that the present weather conditions are very much appreciated by the balata interests. There is every prospect of a bumper yield of balata this year.

Unfortunately, the cost of production is likely to be greatly increased on account of the higher prices of foodstuffs as a result of the war in Europe. Prices at once began to soar and the position became so serious that the government had to step in and fix maximum prices. Nevertheless, the prices fixed by the government are a good deal higher than normal. An even more serious trouble is the demoralization of the rubber and balata market in London and the apprehension that is felt of risking the shipment of large quantities of balata. A gentleman largely interested in the industry points out that there are large quantities of balata lying here, the proceeds from which are needed in circulation, but that the banks will only advance on it at a rate of interest of 6 per cent., and holding at the owner's risk, or if the balata is shipped the owner must pay the extra war risks. The banks cannot be blamed for taking this attitude. They cannot be expected to incur all the risks in handling balata for the sheer delight of assisting somebody else. The gentleman who has raised the question, however, wants to know why the government should not advance the money, take over the risk, and when the balata is released give the balance over to the owners. The simplest way out of the difficulty, of course, is to ship the balata and pay war risks, but the demoralization of the market is a serious obstacle.

The same difficulty is being experienced in the gold and diamond industries. I understand that the government is giving the matter the most serious consideration. It need scarcely be added that in the event of these colonial produce values lying dormant for some time there will be a small army of laborers making themselves very unpleasant on account of their wages. The government, however, has handled the affairs of the colony in so masterly a manner since the war broke out that it is not anticipated that this question will present any serious difficulties.

THE CUSTOMS REPORT FOR A RECORD YEAR FOR BALATA.

The report for 1913 of the Comptroller of Customs, which has just been issued, shows that a record amount of balata was exported last year. The figures for the past five years are as follows:

	Pounds	Value
1909-10	1,034,076	\$468,035
1910-11	1,162,588	670,192
1911-12	1,152,410	707,284
1912	705,214	407,424
1913	1,323,609	768,463

From the figures it will be seen that rubber has not made such good progress, although in the next few years we may confidently look for markedly better results.

	Pounds	Value
1909-10	6,366	\$3,123
1910-11	1,157	900
1911-12	3,474	3,119
1912	216	143
1913	1,340	822

The balata crop of 1913 was exported to the following countries:

	Pounds.	Value.
United Kingdom	1,191,359	\$687,435
United States	130,212	79,601
Germany	2,038	1,427

The comptroller says in the body of his report:

"The quantity of balata exported during 1913 was nearly double the quantity sent out of the colony the previous year. The increase amounted to 618,395 pounds, the rise in value being \$281,039. The total exports of balata for 1913 were 1,323,609 pounds, represented by a value of \$768,463. This is the largest amount of colony balata, both as regards quantity and value, that has been exported in any one trade year. The drought in 1912 retarded work in the up-country balata areas, and the state of the rivers in that year prevented a certain quantity from reaching Georgetown in time for exportation in 1912, so that the exports for 1913 were unduly inflated. Nevertheless the amount actually collected in 1913 was larger than in any former year. Unfortunately the price of balata fell considerably during 1913, and so the producers did not profit to the same extent as it was hoped they would with the increased yield. Balata is used for cables, golf balls, molds for electrical purposes, etc., and it would seem as if its price was regulated to some extent by the price of rubber, as the price fell in sympathy with that of rubber."

PROGRESS IN THE RUBBER INDUSTRY—TAKING PLACE OF OTHER CROPS.

Mr. E. H. S. Floyd, Canadian Trade Commissioner in the West Indies, says in a report which has just been submitted to the Canadian Department of Trade and Commerce: "The balata industry in British Guiana is on the whole in a healthy condition, though the product is being sold at cost price. The area covered in the cultivation of balata is being extended; estates that were previously under coffee, cocoa, fruit trees and sugar cane are now being utilized for rubber. An economical method of bringing an area of rubber up to bearing and one that is fairly general among the planters is to plant in catch crops among the young rubber and in this way reduce to a minimum the outlay necessary in the period required to bring the young trees to maturity. Considering the low price of labor in the colony it is believed that the areas now being extended will produce rubber at a price which will be remunerative, however low the ruling market price may be."

RUBBER SHIPMENTS FROM AMAZON VALLEY.

In a recent statistical return Consul George H. Pickrell, at Pará, showed the aggregate shipments of Brazilian rubber for the crop year ending July 31, 1914, as having been: To the United States, 40,936,545 pounds; to Europe, 44,707,700 pounds; total, 85,644,245 pounds. This total compared with those of previous years gives the following result, in pounds: 1912-13, 94,525,065; 1911-12, 89,957,410; 1910-11, 73,927,605; 1909-10, 86,178,685. The total for the last crop year was only slightly below the average of the last five years and only 9.4 per cent. below the figure for 1912-13. A more extensive falling off had been anticipated.

THE LATE PRESIDENT PENA.

The death on August 9, after protracted suffering, of Dr. Roque Sáenz Peña, President of Argentina, evoked many expressions of regret. He was elected in March, 1910, assuming office on October 12 of the same year, his term as president extending until 1916. Owing to his serious illness he had been of late replaced in the exercise of his duties by the Vice-President, Dr. Victorino de la Plaza.

His earlier experience had been as representative of his country at various international congresses, and likewise in a diplomatic capacity at several European courts.

Recent Patents Relating to Rubber.

UNITED STATES OF AMERICA.

ISSUED AUGUST 11, 1914.

- N**O. 1,105,698. Inflating device. S. E. Thompson, South Williamsport, Pa.
 1,105,654. Elastic wheel. S. C. Thompson, Baltimore, Md.
 1,105,737. Collapsible core. F. K. Williams, assignor of one-half to Williams Foundry & Machine Co., both of Akron, Ohio.
 1,105,880. Tire shoe. F. W. Cooper, Akron, N. J.
 1,105,958. Vehicle wheel tire. F. B. Brown, Jr., Ukiah, Cal.
 1,106,113. Tire for vehicles. M. D. Rulke, Akron, England.
 1,106,238. Resilient tire. F. C. Papad, Akron, Ohio.
 1,106,290. Process of producing isoprene. R. B. Earle and L. P. Kyrie, assignors to Heald Rubber Co., both of Boston, Mass.
 1,106,302. Resilient tire. W. M. Horne, New York, N. Y., assignor of twenty-three and one-third per cent to F. A. Derks and F. Kammler, New York, N. Y., and F. A. R. Southworth, Westwood, N. J.

Design.

- 46,198. Water bag. F. F. Brueser, assignor to The Miller Rubber Co., both of Akron, Ohio.

Trade Marks.

- 51,815. Bon Bon Co., assignor to The Standard Gum Co., Inc., both of New York, N. Y. Pouch for containing black.
 76,133. Greensburg Tire & Rubber Co., Greensburg, Pa. Illustration of, and the word, *Pneumatic*. For inner and outer tubes for pneumatic tires.
 76,134. Greensburg Tire & Rubber Co., Greensburg, Pa. The word *Red Ring*. For inner tubes for pneumatic tires.
 76,329. The Santo Rubber Co., Wilmington, Del., and Pittsburgh, Pa. An Indian's head. For rubber inner and outer tubes.
 76,413. The Santo Rubber Co., Wilmington, Del., and Pittsburgh, Pa. The word *Santo*. For rubber inner and outer tubes.
 76,414. The Santo Rubber Co., Wilmington, Del., and Pittsburgh, Pa. The word *Chief*. For rubber inner and outer tubes.
 77,513. The National Tire Co., Trenton, N. J. The word *National*. For rubber tires and tubes.
 78,558. C. J. Higley, New York, N. Y. The initials C. J. H. For hose supporters.
 78,715. Sprague Sanitary Shield Co., Inc., Minneapolis, Minn. A cross within a circle. For sanitary shields.
 79,367. The Mechanical Rubber Co., Jersey City, N. J. The word *Mercuro*. For electrical insulating tape.

ISSUED AUGUST 11, 1914.

- 1,106,375. Elastic garter with leg covering means suspended therefrom. A. M. Giran, New York, N. Y.
 1,106,506. Expandible collapsible tire core. J. Greenwald, assignor to The Firestone Tire & Rubber Co., both of Akron, Ohio.
 1,106,527. Hat protector. P. Acland, Sonaxford, and J. Acland, Boston, both in Mass.
 1,106,549. Hose rippler. P. Buchner, Portland, Ore.
 1,106,635. Hat pressing or blocking device. B. J. Diaz, Madrid, Spain.
 1,106,701. Rubber tire. P. J. Emmecker, New York, N. Y., assignor to Kelly-Springfield Tire Co., Jersey City, N. J.
 1,106,748. Pneumatic tire. J. Stunnen, Peen, Germany, assignor of one-half to W. Schneider, Charlottenburg, Germany.
 1,106,753. Rubber heel. J. Trisclan, Chicago, Ill.
 1,106,769. Resilient tire filling. S. M. Berry, Indianapolis, Ind.
 1,106,812. Truck tire. H. A. Hollings, assignor of one-half to C. T. Jacobsen, both of San Francisco, Cal.
 1,106,927. Nursing device. W. M. DeCler, Buffalo, N. Y.
 1,106,985. Compound cushion heel. J. J. Stetzel, Elmhurst, Ill.
 1,107,080. Removable rim attachment for vehicle wheels. M. Kuller, Berlin-Lichterfelde, Germany.
 1,107,092. Sectional wheel rim. B. W. Miller, Artesian, S. D.
 1,107,219. Apparel corset. W. Kops, assignor to Kops Bros., both of New York, N. Y.

Design.

- 46,244. Raincoat. N. M. Bush, Montclair, N. J.

Trade Marks.

- 76,361. Hecht & Co., Washington, D. C. The words *Manhattan*. For shoes made of leather, rubber, etc.
 77,721. W. F. Durvea, New York, N. Y. The words *Four*. For fountain pens.
 78,831. G. Elmendorf, Elmhurst, N. Y. The word *Four*. For chewing gum.
 79,375. The Stern & Saalberg Co., New York, N. Y. The word *Four*. For chewing gum.
 79,714. Maryland Rubber Co., Baltimore, Md. The word *Four*. For chewing gum of the animal.

ISSUED AUGUST 18, 1914.

- 1,107,355. Spring wheel. E. Rammelsberg, Ditzmund, Germany.
 1,107,397. Collapsible core. J. Yemiker, Akron, Ohio.
 1,107,398. Collapsible core. J. Yemiker, Akron, Ohio.
 1,107,404. Machine for cutting rubber strips. F. Bielle, Sr., and F. Bielle, Jr., both of Verdun, France.
 1,107,439. Spring wheel. J. W. Nippert, New Brighton, Pa.

- 1,107,441. Squeezer. M. W. Olson, Galesburg, Ill.
 1,107,508. Resilient vehicle tire. L. P. Fitch, Fitch, Mo.
 1,107,641. Function pen feed bar. A. Radini, New York, N. Y.
 1,107,667. Tire for automobiles. C. F. Kerton, Cincinnati, O.
 1,107,717. Brush with rubber suction bulb. F. L. Sharpe, Worcester, Mass.
 1,107,719. Wheel rim construction. H. M. Snyder, assignor to Detroit Demountable Rim Co., both of Detroit, Mich.
 1,107,720. Wheel rim construction. H. M. Snyder, assignor to Detroit Demountable Rim Co., both of Detroit, Mich.
 1,107,819. Weather strip for wind shields of automobiles. A. C. McCrackin, Louisville, Ky.
 1,107,916. Elastic wheel. F. B. Denis, Paris, France.
 1,107,988. Vehicle wheel. A. M. O'Fallon, Nev.
 1,108,001. Gasketing tape. W. E. Taylor, assignor to General Asbestos & Rubber Co., both of Charleston, S. C.

Designs.

- 46,753. Fire casing. J. H. Christian, Detroit, Mich.
 46,758. Vehicle wheel tire. M. D. Rulke, Akron, Ohio.
 46,783. Vehicle wheel tire. M. D. Rulke, Akron, Ohio.
 46,784. Vehicle wheel tire. M. D. Rulke, Akron, Ohio.

Trade Marks.

- 77,189. American Rubber Co., Boston, Mass. The words *American*. For rubber boots and shoes.
 77,580. Giant Tire & Rubber Co., Omaha, Neb. The word *Giant*. For rubber inner and outer tubes for pneumatic tires.
 77,635. Russian-Tire & India Rubber, Gutt, Percha & Telegraph Works, "Pretwoda, Riga," Riga, Russia. An oblong design with the word *Go* through the center.
 77,947. B. Bingham & Son, Ltd., London, England. The word *Light*. For raincoats.
 78,753. Pelica Tire & Rubber Co., New York, N. Y. Picture of a man resting on a tire. For rubber tires.
 78,762. Converse Rubber Shoe Co., Malden, Mass. The word *Go*, which includes a tire. For rubber tires, inner and outer tubes.
 78,834. Giant Tire & Rubber Co., Omaha, Neb. The word *Giant*. For rubber inner and outer tubes for pneumatic tires.
 78,949. Lackland Bros., Fort Worth, Tex. A seal with the word *Valve* across the top. For a tire puncture compound.
 79,701. Imperial Rubber Co., New York, N. Y. The word *Imperial*. For rubber lined hose, rubber hose, tubing, rubber valves, and machinery packing.
 79,706. Minto Co., Inc., Rochester, N. Y. A mint leaf between the words *Minto Gum*. For chewing gum.
 79,770. The Johnstown Automobile Co., Johnstown, Pa. The word *John* in white letters on a black background. For inner tubes, blow-out patches, tire boots and reinforcers.
 79,777. The Pharis Tire & Rubber Co., Newark, Ohio. A little picture of a seal on a rubber tire. For pneumatic tires and inner tubes.

ISSUED AUGUST 25, 1914.

- 1,108,177. Life preserver having inflatable bags. C. Horty, Elkhart, Ind.
 1,108,290. Set of teeth with gutta percha base for practice work in dental surgery. F. D. Weiss, New York, N. Y.
 1,108,389. Tire boot. W. F. O'Neil, Kansas City, Mo.
 1,108,399. Tire compound. H. Santrock, Kensington, Kan.
 1,108,457. Dress shield. E. M. Brennan, Brooklyn, N. Y.
 1,108,546. Rim for wheels. P. B. Bosworth, Akron, Ohio.
 1,108,632. Spring wheel for vehicles. J. F. Sife and H. F. Sife, both of New York, N. Y.
 1,108,640. Valve for pneumatic tires. J. W. Taylor, assignor of one-third to G. A. Mehr and one-third to F. L. Fulton, both of Lansing, Mich.
 1,108,702. Pneumatic wheel tire. M. Clark, Chicago, Ill.
 1,108,703. Vehicle wheel tire. M. Clark, Chicago, Ill.
 1,108,704. A resilient and non-puncturable tire. G. W. Calverley and D. W. Davis, assignors of one-third to W. B. Gray and J. P. Philadelphia, Pa.
 1,108,743. Self-inflating fountain pen. J. Gilbert, Victoria, B. C., Canada.
 1,108,756. Life preserver. T. Hinkle, Santa Rosa, Cal.
 1,108,778. Nursing bottle. S. D. Nichols, Resbury, Vt.

N. B. Printed copies of specifications of United States patents may be obtained from the India Rubber World Office at a cost of 10 cents each.

GREAT BRITAIN AND IRELAND.

PATENT SPECIFICATIONS PUBLISHED

1. Rubber gaskets that are assigned to the Patent Office, London, England, which are made of a material which is capable of being compressed and which are adapted for use in the construction of a vehicle.
 The word *Patent* is used in the title of the specification.
 2. A method of manufacturing a rubber tire, which is adapted for use in the construction of a vehicle.
 The word *Patent* is used in the title of the specification.
 3. A method of manufacturing a rubber tire, which is adapted for use in the construction of a vehicle.
 The word *Patent* is used in the title of the specification.

- 469,362 (March 6). New sole for shoes in rubber, vulcanized on felt. J. Massias.
 469,377 (March 7). Improvement in tire for vehicle wheels. R. V. Stahl.

[NOTE.—Printed copies of sheet 277,987 French patent can be obtained from R. Bobet, Ingenieur, 10, Avenue de Villiers, Paris, at 50 cents each, postpaid.]

THE GERMAN EMPIRE.

- 277,536, Class 4c (April 25, 1913). Improvements in hose valves. Ernst Muller, Schlesiensstr., Berlin.
 277,651, Class 28b (August 6, 1912). Airtight rubber hose as a counter-roll for hide and leather working machines. A. H. Kehrbaum, Furstenbergerstrasse, 177, Frankfurt am Main.
 277,653, Class 39b (April 17, 1910). Process for production of elastic masses from glycerine gelatine. Julius Stockhausen, Grefeld.
 277,985, Class 63c (March 2, 1913). Elastic tire, with interchangeable, reciprocally engaging segments, with lateral hollow spaces and a central auxiliary hollow space. Andrew Minette, South Petersburg, Va., U. S. A.
 277,986, Class 63c (October 1, 1912). Rubber tires for motor truck wheels, with metal guards attached to lateral rings. Dr. Carl Weidmann, Leichlingen, Rheinland.
 277,987, Class 63c (March 6, 1913). Machine for manufacture of tire treads. Dr. Lasky & Thropp Circular Woven Tire Co., Trenton, N. J., U. S. A.

THE RUBBER SCRAP MARKET.

WHILE the earlier part of August in the waste market reflected the disturbed conditions in the sales of the crude article, the closing days of the month saw an improved demand with advanced prices. In the first days of September, however, there was some reaction, owing to reclaimers delaying operations in scrap. Still it was generally considered only a question of time when they would resume their normal attitude as consumers of waste.

Thus reclaimers were successful in establishing a lower range of prices for the raw material of their industry. Most large operators were firm in their views, but some of them accepted reduced prices for shoes in limited quantities. Towards the middle of the month, dealers were purchasing shoes more freely, being obliged to pay 6½ cents and offering as low as 6¼ cents for large lots. Owing to their difficulty in procuring supplies of shoes, many dealers were towards the close of the month holding them firm at 7¼ cents, though business with reclaimers was in some cases effected at 7 cents to 7½ cents.

In auto tires, business at the commencement of the month was completely stagnant, the offerings of holders at 5¼ cents meeting with no response from buyers. Manufacturers claimed to have been able to purchase auto tires on the basis of 4½ cents, but this report lacked confirmation, that price having in fact been lately paid by dealers. At the middle of the month, similar conditions prevailed, the market for tires being without animation, and the business done ranging from 4½ cents to 5 cents. Later in the month reclaimers maintained that they could supply their requirements in auto tires at 5 cents and had in some cases offered 4¾ cents. Dealers were themselves offering 4½ cents, but found that price failed to attract quantities. No. 1 inner tubes could be purchased early in the month by consumers at 27 cents, while dealers were willing to buy at 25 cents. By the middle of the month, it was hard to find buyers at from 26 cents to 27 cents, and at a later period 24 cents to 25 cents was quoted, while dealers were willing to purchase in fair quantity at 24 cents for No. 1 and 14 cents for No. 2.

Early in the month small lots of bicycle and solid tires were taken by manufacturers at respectively 3 cents and 5 cents.

Colored scrap is not in demand, while hose is reported quiet at nominally unchanged prices.

Two lots of scrap hose were sold about the middle of the month by the Panama Railroad at New York prices. One lot consisted of 2,562 pounds No. 1 scrap hose at 16¢ and 6

brake and signal hose, and boots and shoes without leather soles, realizing 28¢ cents per pound. Another lot of 49,264 pounds No. 2 scrap hose included steam, water and pneumatic hose, bringing 75 cents per 100 pounds. S. Birkenstein & Sons, of Chicago, were the successful bidders.

Philadelphia reclaimers have been closely watching the situation, business having been light. At Boston there was a lack of important transactions, but the position of dealers was firm. Chicago manufacturers have been limiting their purchases to actual requirements.

RUBBER SCRAP PRICES PAID BY CONSUMERS FOR CARLOAD LOTS, NEW YORK, SEPTEMBER 28, 1914

	Per Pound.
Boots and shoes (without leather soles).....	63¢ 7
Trimmed articles.....	43¢ 5
Auto tires.....	43¢
Solid tires.....	43¢
No. 1 inner tubes.....	24 ¢ 25
No. 2 inner tubes.....	14 ¢ 15
Red tubes.....	16 ¢
Bicycle tires.....	2 ¢ 3
Irony tires.....	2 ¢
Mixed auto peelings.....	7¼ ¢ 7½
No. 1 auto peelings.....	8¼ ¢ 9
Mixed white rubber.....	7¼ ¢ 8¼
No. 1 soft white rubber.....	10 ¢ 10 ¼
White wringer rubber.....	7¼ ¢
No. 1 red scrap.....	9¼ ¢
Mixed red scrap.....	6¼ ¢
Mixed black scrap.....	2 ¢ 2 ½
Rubber car springs.....	3 ¢
Hose shoe pads.....	2 ¢ 2 ¼
Matting and packing.....	2 ¢ 3¼
Garden hose.....	2 ¢
Air brake hose.....	2 ¾ ¢
Cotton tire hose.....	2 ¢ 2 ¾

NATIONAL ASSOCIATION OF WASTE MATERIAL DEALERS.

The annual meeting of the above association took place at the Hotel Astor, New York, on September 15, President Birkenstein, of Chicago, being chairman. There was a large attendance in the various sections.

SCRAP RUBBER.

The Gordon Rubber Co., of Chelsea, Massachusetts, incorporated August 4 with a capital stock of \$10,000, will deal in scrap rubber of all descriptions.

H. L. Seigel, formerly with Max Goodman, of Chicago, has opened a warehouse at 1446-8 South Morgan street, where he will deal exclusively in all grades of scrap rubber. He has associated with him in business David Klein, for a number of years past with the firm of J. Klein & Son.

The Scrap Rubber Dealers' Club, most of whose members are also members of the National Association of Waste Material Dealers, held a meeting at the Hotel Astor, New York, on Tuesday, September 15.

Arno Samson, proprietor of the New Jersey Rubber & Metal Co., of Newark, New Jersey, announces that an additional building, 50 x 100 ft. in area has been taken at 165-7 South Canal street, that city.

An additional meeting of the New Jersey Scrap Rubber Dealers' Club, of Trenton, New Jersey, will be held on October 6.

In this city, a lot of scrap hose was sold by W. J. Birkenstein, of Chicago, on August 27, to S. Birkenstein & Sons, of Chicago, at 75¢ per 100 pounds. The lot consisted of 1375 pounds of No. 1 and No. 2 scrap hose, and 100 pounds of No. 3.

Review of the Crude Rubber Market.

THE month of September continued the reaction from the sudden advance in rubber prices which marked the early part of August. Starting in August 1 at 70/71 cents, a sharp advance on August 5 brought the nominal quotation to \$1.07/1.10, subsequently touching \$1.25 on 14th. At that point a decline set in, which by September 1 had reached 77/78 cents, and by September 14, 69/70 cents, or slightly below the price on August 1. Following a similar course, the market has since dropped a further 6 per cent.; the rate on September 26th being 65/66 cents. This situation has been attributed less to any pressure of supplies than to the abstention of buyers, which last-named feature is expected to lead ere long to the depletion of manufacturers' stocks and their consequent renewal. On the other hand, there has been a feeling that the demand for high-class rubber goods is likely to diminish somewhat, with the result of a reduced demand for fine rubber. The statistical position of Pará is strengthened by the fact that English imports of that description for the eight months ended August 31 last were only 10,000 tons as compared with 12,862 tons for the corresponding period of 1913.

Plantation rubber imported by England from the three principal sources (Straits Settlements, Federated Malay States and Ceylon) aggregated during the above-named eight months 24,122 tons, against 19,399 tons for the corresponding months of last year, thus showing an increase of about 25 per cent. as compared with a falling off to about the same extent in the English imports of Pará. While the shipments of rubber from the East were more or less affected by financial disturbances, the fact that quantities of plantation rubber afloat were reported as, respectively, 8,250, 8,250 and 8,000 tons at the end of March, April and May, falling only to 7,500, 7,500 and 7,650 for June, July and August, indicates that shipments had not yet been appreciably reduced, up to the date of most recent advices.

Tracing the course of plantation prices since August 1, they will be found to have in a great measure reflected the movements of fine Pará rubber. Quotations, it will be recalled, had advanced from 56/57 cents on August 1 to \$1.08 on August 5, receding on August 17 to 90 cents. Since then they have steadily dropped.

For fine Pará the highest price of the month (77/78 cents) was attained on September 1 and 2; the lowest point (65/66 cents) was reached from September 18 to 25.

Plantation reached the highest point (65 cents) from September 4 to 8 and the lowest (56/57 cents) from September 17 to 22.

The results of the war are shown by the fact that English exports of rubber for August were only 1,715 tons, against 3,587 in July, 1914, and 3,912 in August, 1913, indicating a falling off in continental demand. Aggregate English imports of rubber for the first eight months of 1914 were 44,427 tons, as compared with 46,421 for the corresponding period of 1913, the loss in the Brazilian and African quantities being more than offset by the increase in plantation rubber.

An auction of 300 tons plantation was held in London on August 27 which opened fairly, but displayed a falling off

equaling 6 cents per pound towards the close. It had been contemplated to hold another sale towards the close of September, but this has been postponed.

Since the Amsterdam rubber sale of July 29, of 270 tons, no further auction has been held. The dates of the next sales at that port, and at Rotterdam and Antwerp have not been fixed. Business at Antwerp and the other continental centers is considerably affected by the war.

At the Singapore auction of August 12, only 8 tons were sold out of 63 tons offered. Most of the regular buyers were out of the market, in the absence of orders from Europe.

NEW YORK QUOTATIONS.

Following are the quotations at New York one year ago, one month ago, and September 30, the current date:

PARA.	Oct. 1, '13.	Sept. 1, '14.	Sept. 30, '14.
Islands, fine, new.....	71a72	65a70	48a50
Islands, fine, old.....	.....	.....	50a52
Upriver, fine, new.....	80a82	75a80	63a65
Upriver, fine, old.....	85a86	.....	66a68
Islands, coarse, new.....	29a30	45a	26a28
Islands, coarse, old.....	.....	.....	.....
Upriver, coarse, new.....	48a49	55a60	44a45
Upriver, coarse, old.....	.....	.....	.....
Cameta.....	36a37	40a	28a29
Cauchó, upper.....	48a49	50a	44a45
Cauchó, lower.....	.....	.....	41a43

PLANTATION CEYLON.

Fine smoked sheet.....	60a61	75a80	63a64
Fine pale crepe. { near-by } { forward }	52a54	70a75	61a62 59a60
Fine sheets and biscuits un-smoked.....	51a53	70a75	59a60

CENTRALS.

Corinto.....	.....	50a	40a42
Esmeralda, sausage.....	40a42	45a	40a41
Guayaquil, strip.....	.....	.....	.....
Nicaragua, scrap.....	40a41	40a	40a41
Panama.....	.....	.....	.....
Mexican plantation, sheet.....	.....	.....	35a45
Mexican, scrap.....	40a42	45a	39a41
Mexican, slab.....	.....	.....	.....
Mangabeira, sheet.....	.....	.....	.....
Guayule.....	.....	55a	45a50
Balata, sheet.....	66a67	62a64	54a56
Balata, block.....	45a46	.....	43a47

AFRICAN.

Lopori, ball, prime.....	50a	.....	.....
Lopori, strip, prime.....	.....	.....	.....
Aruwini.....	40a42	.....	.....
Upper Congo, ball red.....	45a46	.....	.....
Ikelemba.....	.....	.....	.....
Sierra Leone, 1st quality.....	45a46	.....	.....
Massai, red.....	.....	75a85	.....
Sondan Niggers.....	.....	36a46	.....
Cameron, ball.....	35a40	.....	42a44

Benguela
Madagascar, pinky
Accra, flake ..

EAST INDIAN

Assam 52 1/2 58
Pontianak 52 1/2 58

New York.

In regard to the financial situation, Albert B. Beers (broker in crude rubber and commercial paper, No. 68 William street, New York) advises as follows: "During September money market conditions as regards commercial paper have not changed much from those prevailing the latter part of August, as reported. Banks in this city have been almost entirely out of the market, and out-of-town banks have been only small buyers, with rates ruling at 7 1/2 to 8 per cent. for the best rubber names and 8 1/2 to 9 per cent. for those not so well known."

NEW YORK PRICES FOR AUGUST (New Rubber)

	1914.	1913	1912
Upriver, fine	\$0.75 a 1.15	\$0.84 a 0.94	\$1.16 a 1.23
Upriver, coarse .....	.43 a .89	.51 a .53	.89 a .96
Islands, fine .....	.60 a 1.00	.74 a .81	1.06 a 1.13
Islands, coarse .....	.30 a .60	.29 a .33	.56 a .59
Cametti .....	.3 a .61	.38 a .41	.64 a .78

IMPORTS FROM PARA AT NEW YORK.

(The Figures Indicate Weight in Pounds)

August 27 By the steamer *Donis* from Pará and Manaus

	Fine	Medium	Coarse	Cauchó	Total
Arnold & Zeiss	220,000	4,000	19,500	41,800	306,100
General Rubber Co.	138,500	1,700	46,800	6,600	213,700
Meyer & Brown	63,700	14,000	6,900	17,500	109,100
Henderson & Korn	93,100	15,500	7,700	17,500	133,800
H. A. Astlett & Co.	8,300		24,400	21,100	73,800
Robinson & Co.	49,700				49,700
Robinson & Co., Whitworth & Co.	38,900				38,900
W. R. Grace & Co.				9,500	10,500

Total 635,500 80,400 104,000 115,000 935,000

SEPTEMBER 8. By the steamer *Purnu* from Pará

Arnold & Zeiss	95,100	2,500	60,800	58,800	237,200
Meyer & Brown	91,800	4,500	41,700	3,500	141,500
Hagemeier & Brown	57,800	1,100	15,000		68,900
G. Amisnick & Co.	4,300	3,300	8,400	4,300	40,300
H. A. Astlett & Co.	109,400	1,400	57,600	7,900	176,300
Henderson & Korn	4,000	3,900	28,700	3,000	39,600
Crossman & Siedelken	6,500	1,600	1,600	200	9,900

Total 383,900 18,300 113,800 77,700 713,700

SEPTEMBER 15 By the steamer *Justin* from Pará and Manaus

Arnold & Zeiss	83,000	13,000	15,100	56,800	167,900
Meyer & Brown	79,700	9,000	38,000	9,500	166,000
General Rubber Co.	29,600				29,600
Robinson & Co.	38,300				38,300
Henderson & Korn	154,000	8,000	34,400	3,000	239,400
H. A. Astlett & Co.	9,000		44,700	300	54,000
Crossman & Siedelken	7,100		15,800	38,200	155,100
G. Amisnick & Co.	1,300	700	8,500		21,800

Total 672,800 30,900 156,800 39,700 874,700

PARA RUBBER VIA EUROPE.

August 29 By the *Empire* Liverpool

Johnstone, Whitworth & Co. (Fine)	33,000
Johnstone, Whitworth & Co. (Coarse)	10,000
Johnstone, Whitworth & Co. (Cauchó)	67,000
Arnold & Zeiss (Fine)	33,000
Arnold & Zeiss (Cauchó)	1,000
Rubber Trading Co. (Fine)	6,000
Various (Fine)	83,000 113,300

SEPTEMBER 1 By the *Pro* Liverpool

General Export & Commission Co. (Fine)	6,000
General Export & Commission Co. (Coarse)	1,000 7,000

SEPTEMBER 3 By the *Matara* Colon Bahia

G. Amisnick & Co. (Fine)	500
G. Amisnick & Co. (Coarse)	700 3,700

SEPTEMBER 5 By the *Cebu* Liverpool

Earle Bros. (Fine)	4,500
Johnstone, Whitworth & Co. (Cauchó)	11,000 15,700

SEPTEMBER 8 By the *Nyuma* Liverpool

Arnold & Zeiss (Fine)	11,500
Johnstone, Whitworth & Co. (Coarse)	13,500
Various (Fine)	7,000 31,700

SEPTEMBER 14 By the *Empire* Liverpool

Johnstone, Whitworth & Co. (Fine)	4,500
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SEPTEMBER 14 By the *Zebu* Liverpool

General Export & Commission Co. (Fine)	33,500
General Export & Commission Co. (Coarse)	10,000 43,500

SEPTEMBER 18 By the *Matara* Colon Bahia

Yglesias, Lolo & Co. (Fine)	9,000
Yglesias, Lolo & Co. (Coarse)	1,000
G. Amisnick & Co. (Fine)	4,000
American Trading Co. (Fine)	8,000 22,000

CENTRALS

[* This sign, in connection with initials, denotes Guayule rubber.]

August 26 By the *Empire* Liverpool

Mecke & Co.	10,000
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August 26 By the *Empire* Liverpool

G. Amisnick & Co.	5,300
Pablo, Calvet & Co.	5,100
Wessels, Kulenkampff & Co.	3,400
American Trading Co.	2,300
A. M. Capen's Sons	2,100
Harburger & Stack	100 18,500

August 31 By the *Empire* Mexico

F. Steiger & Co.	1,000
Harburger & Stack	300
H. Marquardt	300
Various	1,000 17,000

August 31 By the *Empire* Tampico

F. Steiger & Co.	80,000
M. R. Ayl.	7,000 107,000

SEPTEMBER 1 By the *Empire* New Orleans

F. Steiger & Co.	7,000
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SEPTEMBER 1 By the *Empire* Colon

Is. C. Robinson & Bros.	2,000
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SEPTEMBER 1 By the *Empire* Colon

Laurence Johnson & Co.	10,000
Isaac B. Gordon & Co.	3,000
G. Amisnick & Co.	1,000
J. S. Simbada & Co.	1,000 18,400

SEPTEMBER 3 By the *Empire* Mexico

H. Marquardt & Co.	300
Harburger & Stack	600
Mexico Hide Co.	300
J. A. Medina Co.	400 1,600

SEPTEMBER 8 By the *Empire* Cartagena

R. del Castillo & Co.	1,500
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SEPTEMBER 8 By the *Empire* Bahia

Adolph Hirsch & Co.	8,500
Rosbach Bros. & Co.	31,000 103,500

SEPTEMBER 8 By the *Empire* Tampico

Mader Bros. & Co.	33,500
F. Nutter	33,500 67,000

SEPTEMBER 11 By the *Empire* Colon

G. Amisnick & Co.	9,000
Amisnick Trading Co.	8,000
Wessels, Kulenkampff & Co.	1,000
A. M. Capen's Sons	1,000
W. R. Grace & Co.	1,000
McLe & Co.	1,000
Public, Carter & Co.	1,000
Mexico Hide Co.	300 20,000

SEPTEMBER 11 By the *Empire* New Orleans

F. Steiger & Co.	500
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SEPTEMBER 14 By the *Empire* Tampico

Mader Bros. & Co.	33,500
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SEPTEMBER 14 By the *Empire* Mexico

Steiger & Co.	6,000
Harburger & Stack	1,000
H. Marquardt & Co.	2,000
G. Amisnick & Co.	700 7,700

SEPTEMBER 14 By the *Empire* Mexico

G. Amisnick & Co.	500
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SEPTEMBER 14 By the *Empire* Colon

F. Steiger & Co.	10,700
Amisnick Trading Co.	6,800
F. S. Simbada & Co.	1,000
G. Amisnick & Co.	5,000 24,100

SEPTEMBER 18 By the *Empire* Cartagena

Calder & Blum	4,500
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SEPTEMBER 18 By the *Empire* Colombia

G. Amisnick & Co.	17,000
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SEPTEMBER 18 By the *Empire* Bahia

Rosbach Bros. & Co.	40,500
Laurence Johnson & Co.	6,500
Adolph Hirsch & Co.	4,000 96,000

AFRICAN

Pounds.

SEPTEMBER 1 By the *Empire* Liverpool

Henderson & Korn	18,000
Earle Bros.	4,500
Rubber Trading Co.	11,000 33,700

SEPTEMBER 11 By the *Empire* Liverpool

Henderson & Korn	13,500
Earle Bros.	9,000
Robinson & Co.	2,000 24,500

SEPTEMBER 14 By the *Empire* Havre

Arnold & Zeiss	15,000
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SEPTEMBER 14 By the *Empire* Liverpool

Arnold & Zeiss	35,000
Johnstone, Whitworth & Co.	4,000 39,000

SEPTEMBER 14 By the *Empire* Lashon

Various	95,000
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SEPTEMBER 19 By the *Empire* Liverpool

Earle Bros.	9,000
Henderson & Korn	2,000
Rubber Trading Co.	11,000 22,000

EAST INDIAN.

[* Denotes plantation rubber.]

August 26 By the *Empire* Liverpool

Henderson & Korn	33,500
Johnstone, Whitworth & Co.	3,000
Arnold & Zeiss	3,000
Raw Products Co.	6,000 109,000

August 31 By the *Empire* Havre

Michael, Inc. Co.	24,000
Henderson & Korn	24,000 48,000

SEPTEMBER 1 By the *Empire* Rotterdam

Rubber Trading Co.	11,000
Arnold & Zeiss	4,000
Robinson & Co.	2,000 17,000

SEPTEMBER 1 By the *Empire* Colon

Johnstone, Whitworth & Co.	11,000
General Rubber Co.	1,000
Earle Bros.	4,000
Arnold & Zeiss	4,000
Laurence Johnson & Co.	6,500
Henderson & Korn	2,000
Rosbach Bros. & Co.	31,000 61,500

SEPTEMBER 1 By the *Empire* Mexico

H. Marquardt & Co.	300
Harburger & Stack	600
Mexico Hide Co.	300
J. A. Medina Co.	400 1,600

SEPTEMBER 11 By the *Empire* Colon

G. Amisnick & Co.	9,000
Amisnick Trading Co.	8,000
Wessels, Kulenkampff & Co.	1,000
A. M. Capen's Sons	1,000
W. R. Grace & Co.	1,000
McLe & Co.	1,000
Public, Carter & Co.	1,000
Mexico Hide Co.	300 20,000

SEPTEMBER 11 By the *Empire* New Orleans

F. Steiger & Co.	500
------------------	-----

SEPTEMBER 8.—By the <i>C. B.</i> —Liverpool:	
Various	*16,500
SEPTEMBER 8.—By the <i>Rochambeau</i> —Havre:	
Michelin Tire Co.	*33,500
SEPTEMBER 8.—By the <i>Albatross</i> —Rotterdam:	
Various	*1,000
SEPTEMBER 8.—By the <i>Mermaid</i> —London:	
I. Littlejohn & Co.	*141,000
Charles T. Wilson	*135,000
Robert Badenhop	*25,000
Hedema Rubber Co.	*11,000
W. R. Grace & Co.	*7,000
Raw Products Co.	*11,000
Fredk. Probst & Co.	*15,000
Johnstone, Whitworth & Co.	*370,000
S. R. Herke	*27,000
Robinson & Co.	*76,000
Earle Bros.	*25,000
Rome Wire Co.	*11,000
Ed. Maurer	*62,000
W. Stiles	*13,500
Rumsey & Grootert Co., Inc.	*4,500
Meyer & Brown	*45,000
Various	*240,000
SEPTEMBER 8.—By the <i>Minerva</i> —Singapore:	
Ed. Maurer	*50,000
Henderson & Korn	*100,000
Ed. Roustead & Co.	*6,000

SEPTEMBER 8.—By the <i>W. H. B.</i> —London:	
Various	*15,000
SEPTEMBER 8.—By the <i>W. H. B.</i> —London:	
Various	*300,000
SEPTEMBER 8.—By the <i>W. H. B.</i> —London:	
Various	*700,000
SEPTEMBER 8.—By the <i>W. H. B.</i> —Singapore:	
I. Littlejohn & Co.	*3,000
I. Littlejohn & Co.	*12,500
Johnstone, Whitworth & Co.	*8,000
Various	*8,000
SEPTEMBER 14.—By the <i>Albatross</i> —Saarbrücken:	
Various	*50,000
SEPTEMBER 16.—By the <i>Albatross</i> —Rotterdam:	
Various	*8,500
SEPTEMBER 17.—By the <i>Mermaid</i> —London:	
Meyer & Brown	*285,000
Otto Isenstein & Co.	*22,500
General Rubber Co.	*210,000
Arnold & Zeiss	*80,000
Johnstone, Whitworth & Co.	*57,000
Henderson & Korn	*11,200
Earle Bros.	*16,000
Charles T. Wilson	*6,000
Ed. Maurer	*60,000
Robert Badenhop	*10,000
Various	*565,000
SEPTEMBER 18.—By the <i>Cretic</i> —Liverpool:	
General Rubber Co.	*130,000

SEPTEMBER 19.—By the <i>Bath</i> —Liverpool:	
General Rubber Co.	*72,500
Meyer & Brown	*22,500
Various	*95,000

CUSTOM HOUSE STATISTICS.

PORT OF NEW YORK, AUGUST, 1914.

Imports:	Pounds	Value.
India rubber	6,344,099	\$3,020,880
Latex	173,896	92,806
Gutta percha	79,362	17,333
Gutta jelutong (Pontianak)	1,105,360	51,441

Total

Exports:	Pounds	Value.
India rubber	5,474	3,400
Rubber scrap, imported	480,224	32,921
Rubber scrap, exported	117,043	13,684

BOSTON IMPORTS IN AUGUST, 1914.

	Pounds.	Value.
Gutta jelutong	191,580	\$7,266
Gutta percha	23,232	2,387
India rubber	247,773	118,466

EXPORTS OF INDIA RUBBER AND CAUCHO FROM PARA, MANAOS AND IQUITOS DURING THE MONTH OF AUGUST, 1914.

EXPORTERS—	NEW YORK.					EUROPE.					GRAND TOTAL.
	Fine.	Medium.	Coarse.	Caucho.	TOTAL.	Fine.	Medium.	Coarse.	Caucho.	TOTAL.	
Zarges, Berringer & Co., kilograms	99,202	21,088	38,958	45,360	204,608	130,986	6,029	20,045	33,382	190,442	395,050
General Rubber Co. of Brazil	61,346	7,812	32,650	13,537	115,345	.....	.....	.....	.....	.....	115,345
J. Marques	129,195	11,298	63,972	27,388	231,853	25,120	4,466	5,997	4,449	40,032	271,885
R. O. Ahlers & Co.	31,719	1,170	4,555	1,087	38,531	6,739	.....	429	3,745	10,913	49,444
Suarez, Hermanos & Co., Ltd.	21,759	.....	.....	.....	21,759	.....	.....	.....	.....	.....	21,759
Pires, Teixeira & Co.	14,960	1,530	24,210	.....	40,700	20,740	.....	.....	.....	20,740	61,440
Adelbert H. Alden, Ltd. ....	.....	.....	.....	.....	.....	30,693	2,875	23,096	106	56,770	56,770
Sundry exporters	29,262	2,981	38,025	67,472	137,740	.....	.....	.....	.....	.....	137,740
Itacatiara, direct	2,024	132	520	1,050	3,726	2,126	.....	.....	.....	2,126	5,852
Manaos, direct	389,467	46,011	202,890	155,894	794,262	216,404	13,370	49,567	41,682	321,023	1,115,285
Iquitos, direct	293,222	44,801	35,456	50,762	424,241	114,325	54,016	38,066	67,000	273,407	697,648
Total	682,689	90,812	238,346	306,656	1,218,503	330,729	67,386	87,633	108,682	594,430	1,812,933

UNITED KINGDOM.

IMPORTS OF RUBBER—SIX MONTHS ENDING JUNE 30.

From:	1912		1913		1914	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
French West Africa	2,345,000	£320,911	1,672,300	£227,624	456,100	£43,674
Peru	1,922,000	365,841	1,561,800	264,629	1,044,400	131,100
Brazil	17,429,400	3,557,140	23,591,900	4,125,208	19,053,400	2,441,988
Gold Coast	1,053,800	116,810	1,273,000	127,073	444,500	37,142
Straits Settlements (including Lebuan)	11,017,200	2,502,688	15,891,000	3,089,916	21,092,700	2,457,917
Federated Malay States	6,074,100	1,399,658	10,450,100	2,059,961	11,403,900	1,327,827
Ceylon	3,780,300	899,416	6,102,900	1,212,732	7,987,800	931,983
Other countries	13,986,600	1,225,703	21,189,100	1,348,131	18,220,300	1,034,563
Total	57,608,400	£10,388,167	81,732,100	£12,455,274	79,703,100	£8,406,194

RE-EXPORTS OF RUBBER—SIX MONTHS ENDING JUNE 30.

	1912		1913		1914	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Russia	4,169,500	£847,896	7,928,100	£1,413,775	8,422,400	£976,369
Germany	10,170,000	1,933,323	12,589,900	2,144,704	12,564,700	1,361,935
France	5,308,100	1,168,453	5,395,200	987,616	8,015,900	961,644
United States	17,340,500	3,527,088	17,703,100	2,789,477	29,196,300	3,271,147
Other countries	4,547,700	881,006	6,542,000	1,114,009	7,299,400	844,729
Total	41,535,800	£8,357,766	50,158,300	£8,449,581	65,498,700	£7,415,824

GUTTA PERCHA—SIX MONTHS ENDING JUNE 30.

	1912		1913		1914	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Imports	283,053	£270,867	574,634	£596,190	3,742,880	£369,475
Re-exports	39,004	49,158	586,992	62,518	455,392	52,582

Plantation Rubber from the Far East.**EXPORTS OF CEYLON GROWN RUBBER**

(From January 1 to August 27, 1914, and for the corresponding period of 1913.)

	1913.	1914
To Great Britain	7,127,486	9,867,203
To United States	3,814,932	5,255,053
To Belgium	2,114,687	2,936,870
To Australia	321,249	339,603
To Japan	151,572	215,100
To Germany	138,152	1,037,415
To Italy	36,507	1,772
To Austria	27,946	
To Straits Settlements	20,064	42,535
To Holland	992	
To India	881	1,050
To France		250,712
To Russia		105,212
Total	13,754,468	20,052,525

(Same period 1912 6,957,230, same period, 1911—3,128,993.)

The export figures of rubber given in the above table include the imports re-exported. (These amount to 2,538,771 pounds—2,043,168 pounds from the Straits and 483,979 pounds from India.) To arrive at the approximate quantity of Ceylon rubber exported to date, deduct the imports shown in the import table from the total exports.

TOTAL EXPORTS FROM MALAYA

(From January 1 to dates named. Reported by Barlow & Co., Singapore. These figures include the production of the Federated Malay States, but not of Ceylon.)

	Singapore July 16.	Malacca July 31.	Penang, June 30.	Port Swet Tenham, July 31.	Total
Great Britain	11,807,317	2,902,409	8,888,467	14,519,996	38,118,189
Continental	1,663,066	30,474	4,88,800	1,801,598	3,913,898
Japan	601,047				601,047
Ceylon	57,128		883,067	986,294	1,821,486
United States	6,119,142		8,64,400	1,36,890	6,776,432
Australia	88,467				88,467
Total, 1914	19,881,467	3,032,883	14,677,734	17,444,447	51,266,331
Total, 1913	12,944,888		8,888,666	15,902,388	35,735,942
Total, 1912	8,911,333		3,966,968	9,998,195	19,876,596
Total, 1911	766,37		2,001,110	3,401,716	11,634,543

PRICES OF CHEMICALS AND COMPOUNDING INGREDIENTS, SEPTEMBER 28, 1914.**VULCANIZING INGREDIENTS.**

SULPHUR.	Per Cwt.
Flour	\$2.00 @ 2.40
Flowers	2.20 @ 2.60
Per Pound	
Crimson antimony	\$0.38
Golden antimony	0.28
French antimony	
Vermilion	
Black hypo	
Sulphur chloride	0.08

FILLERS

ZINC OXIDE.	Per Pound
American process	\$0.05 1/2
French process, red seal	0.06 1/2
French process, green seal	0.07
French process, white seal	0.07 1/2
French, imported	
German, imported	

LITHOPONE.	Per Pound
American	\$0.03 3/4 @ 4

MAGNESIA.

	Per Ton.
Calculated, domestic	\$28.50 @ 29.50
Calculated, imported	
Carbonate, domestic	21.00 @ 35.00
Carbonate, imported	

	Per Pound.
Light precipitated, heavy	08 @ 10
Light precipitated, heavy	07 @ 08

BARITES.

	Per Ton.
Imported	
Domestic	\$20.00 @

WHITING, per cwt.

	Per Pound
Blanc fixe	\$00.03 1/2 @
Litharge	00.05 1/4 @ 00.05 1/2

Prepared lime	
Red oxide, orange mineral	00.07 1/2 @ 00.08
Zinc sulphide	
Red lead, American	00.05 1/4 @ 00.06
White lead	00.05 1/4 @ 00.05 1/2
Lampblack	00.03 @ 00.07
Asbestos powder	
Pumice stone	
Vegetable black	
Graphite	
Ultramarine blue	
Colored pigments	

SOLVENTS.

	Per Pound.
Carbon bisulphide	\$00.10 @ 00.15
Carbon tetra chloride, drums	00.14 @
Naphtha	
Benzol, 50 per cent, drums	00.28 @

OTHER OILS AND WAXES

	Per Pound.
Beeswax, yellow, crude	\$00.30 @ 00.32
Ozokerite, refined yellow	00.25 @ 00.30
Paraffine wax	00.04 1/2 @ 00.04 1/2
Rape oil	00.95 @
Linseed oil, in carloads	00.51 @
Vaseline	
Rosin oil	00.25 @
Glycerine, C. P., in bulk	00.25 @
Ceresin wax, white	00.15 @ 00.25

MISCELLANEOUS

	Per Pound.
Shellac, fine orange	\$00.24 @ 00.25
Mineral rubber	
Per Ton.	
Ground mica	
Powdered soapstone	
Talc, American	\$15.00 @ 20.00

PARALLEL BETWEEN WASTE RUBBER AND RAGS

In discussing the possible competition between synthetic and waste rubber the "Produkten-Markt" of Berlin states that if a really suitable synthetic rubber is produced, the rubber waste trade will not be killed but must expect a considerably lower range of prices. Similar conditions prevailed 35 years ago when wood-pulp was introduced in competition with rags and the rag dealers became alarmed at the prospect. Yet the rag trade is not dead, though the wood-pulp industry is prosperous.

Reference is made to an American statement to the effect that the rubber waste trade has never been so large as during the last few months, although prices have receded.



Vol. 51.

October 1, 1914.

No. 1.

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CANADIAN NOTES.

The Beaver Tire & Rubber Co., Ltd., has been incorporated with a capital stock of \$555,000 and will operate a plant at Calgary, Alberta, for the manufacture of tires, etc.

A by-law has been passed at St. Catharines, Ontario, by which the Marathon Rubber Co., of Akron, in return for the erection and operation in the former city of a plant costing at least \$50,000 and employing at least 100 operatives at the start, is to be granted a five-acre site and a fixed assessment of \$10,000 for ten years.

The J. F. Holden Rubber Co., of 699 Yonge street, Toronto, Ontario, has been appointed Canadian agent for Diamond tires.

The Gutta Percha & Rubber, Ltd., has been granted a permit for the erection of a factory on West Lodge avenue, Toronto, Ontario. Work on this plant—which is to be of steel and brick construction and to cost in the neighborhood of \$100,000—will probably not be started for some time.

DOMINION SYSTEM EMPLOYEES MAKE PATRIOTIC CONTRIBUTIONS.

Each employe of the Dominion Rubber System—which comprises the twenty or more branches and warehouses of the Canadian Consolidated Rubber Co., Ltd., and its factories in Montreal, Granby and St. Jerome, Quebec, and Berlin and Port Dalhousie, Ontario—will contribute one day's pay to the Canadian National Patriotic Fund for the assistance of dependents of soldiers in the field and on active service. As none of the factories of the System, which employs several thousand persons, have been shut down owing to the war, but rather are in some cases working ten hours a day instead of eight, the contribution will probably be a large one.

RUBBER PROSPECTS FROM AN ENGLISH POINT OF VIEW.

English investors are reported to be holding their rubber shares, except in cases where they are obliged by circumstances to realize. The opinion is generally entertained that such investments are on a better basis than they occupied before the war, owing to the various factors in operation.

Discussing the question of a possible shortage, Mr. H. N. E. Longworthy, chairman of the Mincing Lane Share Brokers' Association, has expressed the opinion that, in view of the reduced supplies of wild rubber to be anticipated, the falling off from that source will be a heavy one. That consumption is being maintained was shown by the fact that for the first week of September, English landings of plantation rubber had been 832 tons and deliveries 791 tons, the present London stock of plantation being 3,638 tons against 3,145 tons a year ago. This situation, in spite of the war, he regarded as decidedly satisfactory. Other features imparting strength to the market were the activity of the industry in America and in the north of England. In the latter quarter many plants are working to their full capacity.

Very few industries have received such help as has been afforded rubber planters through the action of the governments of the Malay States and the Netherland Indies in facilitating the shipment of rubber by the necessary financial arrangements.

A CEYLON CONTINGENT FOR THE ENGLISH ARMY.

At a recent meeting of the Ceylon Association, of London, it was stated that nearly a hundred applications had been registered for the proposed contingent of Ceylon men then in England. With regard to those enlisting, a resolution, proposed by Mr. C. A. Talbot and seconded by Mr. Arthur Lampard, was unanimously adopted, recommending all proprietors and directors of companies to allow enlistees half pay for six months, and to let them resume their employment at the close of the war. The question was, however, subject to reconsideration in the event of the hostilities lasting more than the above-named time.

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Vol. LI. No. 2.

NOVEMBER 1, 1914.

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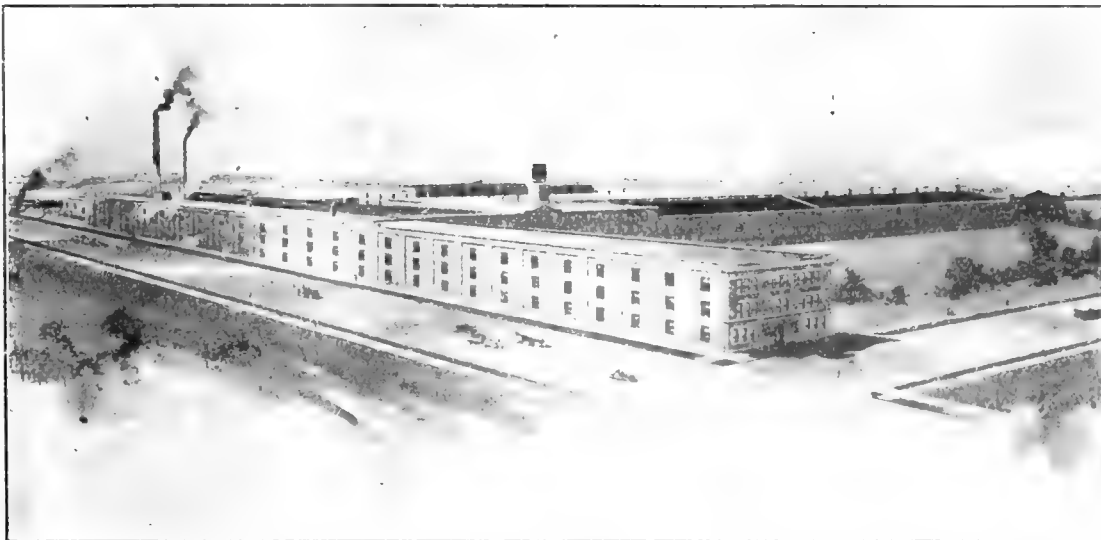


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Write for Bulletin W-161

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Published on the 1st of each Month by

THE INDIA RUBBER PUBLISHING CO.

No. 25 West 45th Street, New York.

CABLE ADDRESS: IRWORLD, NEW YORK.

HENRY C. PEARSON, Editor

Vol. 51. NOVEMBER 1, 1914. No. 2

SUBSCRIPTIONS: \$3.00 per year, \$1.75 for six months, postpaid, for the United States and dependencies and Mexico. To the Dominion of Canada and all other countries, \$3.50 (or equivalent funds) per year, postpaid.

ADVERTISING: Rates will be made known on application.

REMITTANCES: Should always be made by bank draft or Postoffice or Express money order on New York, payable to THE INDIA RUBBER PUBLISHING COMPANY. Remittances for foreign subscriptions should be sent by International Postal Order, payable as above.

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Entered at the New York postoffice as mail matter of the second class.

TABLE OF CONTENTS ON LAST PAGE OF READING.

SOME SPECIAL FEATURES IN THIS NUMBER.

A COMPLETE index of the contents of this issue will be found on page 116. This paragraph is intended simply to call attention to a few of the special features. Mr. Leo E. Miller, who accompanied Colonel Roosevelt on his South American explorations a year ago, describes and illustrates, on pages 62 to 65, the gathering of rubber as he saw it in Brazil and British Guiana.

Dirigibles and aeroplanes are playing a prominent part in the present war, and an authoritative article, fully illustrated, on the method of testing balloon fabrics will be found on pages 69 to 72. Six pages, from 89 to 94, are devoted to rubber goods that have recently come on the market and to new machinery for use in rubber factories. The latest discoveries of the rubber chemists receive two pages—67 and 68. The papers read at the late London Rubber Conference are briefly described by a member of that body on pages 98 and 99.

The effect of the war on the rubber trade in England and on the Continent is a matter of supreme interest to American rubber manufacturers. The English situation is described by two resident correspondents on pages 95 to 97; while conditions in Germany are given in considerable detail on pages 101 and 102.

CRUDE RUBBER CONTRABAND.

THE status of crude rubber as viewed by the belligerents has undergone several changes since the beginning of hostilities. At first only tires, dirigibles, aeroplanes and fabrics employed in their manufacture were put on the contraband list. Then, late in September, the British Government added crude rubber to the list of conditional contrabands. That is, it could be exported to certain ports in Europe—those of France, Belgium, Russia, Spain and Portugal—but to no others. Early in October the French Government placed crude rubber among the absolute contraband articles, and later in the month the British Government practically made all plantation rubber contraband by decreeing that no shipments from the Far East plantations under British control should be made anywhere except to London. This was followed a few days ago, according to cables received in New York, by the prohibition of all exports of crude rubber from an English port. In other words, the British Government decreed that all rubber from British controlled plantations should go to England and stay there, at least for the present.

It was given out that the requirements of the allied armies would be sufficient to absorb practically the whole plantation production for the next six months. It was stated that the British and French military authorities would need a new equipment of tires for the quarter million motor transport vehicles now being used in the war, and that there would be a great demand for water-proof ground sheets for the troops; for rubber boots, to be used in digging trenches; for all kinds of surgical appliances, and for various other articles incident to military operations.

But will England really require for her own use and for that of the Allies all the plantation rubber which normally should be shipped during the next six months? According to estimates made earlier in the year, the plantation output for the next half year should amount to thirty-five thousand tons. Now, during the first six months of the present year England imported a little over thirty-five thousand tons and exported a little over twenty-nine thousand tons, retaining for her own manufacturing purposes less than seven thousand tons. In other words, during the first half of the present year England's consumption of crude rubber amounted to a little over a thousand tons per month; and she now practically announces that during the next six months her rubber consumption will amount to six thousand tons per month,

or six times what it was before the beginning of the war. Obviously, this will hardly be the case, for while the demands made by the British and allied armies for rubber goods will be large, the general consumption by the people of England, France and Belgium will assuredly be materially decreased.

The probability is that the British Government does not expect to need the entire plantation product for the next six months, but purposes to be in a position to let none of this rubber go through any channels where it may ultimately help the enemy. It is quite likely that plantation rubber will be permitted to leave London for New York where it is accompanied by satisfactory guarantees that it will not later find its way, in the form of tires or other military equipment, to the armies of the two Kaisers.

If London should absolutely retain every ton of plantation rubber during the next six months, compelling the United States to depend entirely upon shipments from Para, the supply would certainly be scant, for during the six months beginning with November, 1913, the receipts of South American rubber in the United States amounted to less than twelve thousand tons. There is no reason to believe that the receipts for the next six months will be any greater than they were a year ago. But the situation even without plantation rubber would not be so desperate as it may appear, for there is reclaimed rubber—an ever present help in time of trouble.

SELLING TO BELLIGERENTS VIOLATES NO LAW.

THERE has been so much misunderstanding among American exporters and manufacturers regarding the sale of our merchandise to the belligerent nations, and so many appeals have been made to the State Department for information as to whether such sales were in violation of our neutrality, that the Department has felt it necessary to issue a statement covering the situation. This has been done by Assistant Secretary Lansing, and done so clearly and explicitly that there would seem to be no further excuse for any misconception. It is only necessary to cite two short paragraphs from his statement, which fairly well cover the whole ground. They are as follows:

"In the first place, it should be understood that, generally speaking, a citizen of the United States can sell to a belligerent Government or its agent any article of commerce which he pleases. He is not prohibited from doing this by any rule of international law, by any treaty provision or by any statute of the

United States. It makes no difference whether the articles sold are exclusively for war purposes, such as firearms, explosives, etc., or are foodstuffs, clothing, horses, etc., for the use of the army or navy of the belligerent.

"Neither the President nor any executive department of the Government possesses the legal authority to interfere in any way with trade between the people of this country and the territory of a belligerent."

Accordingly, any American rubber manufacturer can take all the orders he can get for anything he produces that may be wanted by any of the belligerent countries, whether tires, boots, shoes, coats, hospital accessories or any other kinds of rubber manufacture. The only question he need ask himself, to borrow a current Americanism, is this,—Can he put them across? It is obvious that if his exports are going to the Allies, he runs no very great hazard. If they are intended for Germany or Austria, under present conditions that's another matter.

THE COTTON CRISIS.

IT may be stated at the start that the cotton crisis, while by no means past, is not as acute as it was a short time ago. The assurance given a few days ago by the British Government that there will be no interference with cotton shipments from American ports to Germany or Austria had the instant effect of stimulating exports of this staple from this country. On the receipt of this assurance cotton exports, which had languished ever since the beginning of the war, immediately jumped from a few thousand bales a day up to forty thousand bales, with a probability that equally large shipments will continue. For the first time since the outbreak of the war, orders were received last week from Germany, and shipments began immediately to be made to that country. Simultaneously with this welcome change in the situation there appeared excellent promise of the success of the Bankers Pool, which expects to make one hundred and thirty-five million dollars available for the assistance of the planters. So, while the cotton burden has not been lifted, it assuredly has been materially lightened.

The war, which brought injury to business in this country generally, played particular havoc with the cotton industry. The present crop amounts to fifteen million bales. Normally, ten million bales would have been shipped abroad, but during the first ten weeks after the beginning of hostilities it looked as if barely a million bales would find foreign purchasers, leaving the planters

with a vast aggregate of nine million bales, or nearly two-thirds of the entire crop, unsalable in their warehouses. It is hardly to be wondered at, under these conditions, that the southern contingent at Washington should seek government relief. It will stand out as one of the most notable achievements of the present Congress that with so much sympathy for the southern situation it withstood the great temptation of shifting the planters' burden to the shoulders of the Government which certainly would have been a very bad precedent in paternalism. Further attempts by the southern members of the Senate and the House may be made for government assistance, but every bale that goes abroad from our ports during the next few weeks will make this attack on the Federal Treasury less likely to succeed.

Last year Germany bought 2,785,000 bales of our cotton, with a value of \$182,000,000. It is not to be expected, of course, that there will be any such demand on the part of that country this year, but if Germany were to take one-half of last year's purchases, and the other European countries follow in like proportion, the planters' problem, if not solved, would certainly be much nearer solution.

But the great lesson which the South must learn from its present condition is the necessity of curtailing its cotton proclivities, at least for the next year or two, until demand has overtaken supply. Too much of a good thing is a bad thing. No section can enjoy robust health when its functions are deranged by a great mass of undigested material, be it cotton or what not.

RUBBER PROPAGANDA.

WHEN crude rubber is scarce and high, manufacturers seek substitutes and new compounds. When it is plentiful and low, producers talk restriction of product and new uses. They also become rubber educators. The planters in the Middle East, for example, are considering extensive missionary work among rubber manufacturers to show how much superior plantation rubber is to any other. The producers up the Amazon also plan to institute a "propaganda" among manufacturers to impress upon them the fact that Brazilian Para is best and should therefore always have the preference. Indeed the South American boomers go further. They seriously consider addressing the great consuming public and urging them to demand that what they buy be made of "the best rubber in the world."

No doubt these missionaries will be welcomed, listened to respectfully and given every opportunity to demonstrate their claims, but it is doubtful if these efforts will increase the use of one or the other sorts in the slightest

degree. The only way that the planters can eliminate wild rubber is to produce something better as well as cheaper. The Brazilians can drive out plantation rubber only by producing wild rubber cheaper as well as better. Samples, circulars, propaganda, missionary visits, will not accomplish half as much as even coagulation, clean smoking, and standard brands.

At the annual meeting of the Merchants' Association of New York, held October 15, the manager of the foreign trade department of the National City Bank of that city, described the steps that had been taken by his institution toward the establishment of branch banks in South America. He stated that the staff for the bank to be established in Buenos Aires had already been selected and was on its way to that city; that suitable quarters had been secured, and that the bank would be in active operation during the present month. This is the first American bank ever established in any foreign country.

Few people outside of banking and exporting circles have any appreciation of the significance of this new enterprise and its particular significance as pertaining to South America. The great obstacle in the way of increased commerce between North and South America has been the necessity of financing all such operations through European banks. This necessity will now be entirely removed.

FOR FIFTY YEARS THE CHAMBER OF COMMERCE OF NEW YORK has enjoyed an unbroken series of successful annual banquets. This year, because of the great war and the widespread distress and suffering, there is to be none. Members of other prominent associations have taken the same action. This, of course, entails self denial on the part of feasters, orators and listeners, but as a practical expression of sympathy it is excellent. For America to feast and rejoice while Europe starves and mourns might smack of callousness. The Rubber Club of America has been canvassed by its secretary for an expression of opinion regarding its banquet slated for January 5 next.

The members were asked to state their preference, whether to hold the dinner or to omit it and donate the amount that the dinner would have cost to the American Red Cross. Responses have not yet been received from the entire membership, but nearly two-thirds have replied, and of that number the sentiment is so overwhelming in favor of omitting the dinner and contributing the amount to the Red Cross and other humane agencies which are seeking to mitigate the horrors of the war in Europe, that it has been definitely determined to abandon the dinner.

Among the Rubber Collectors of the Remote South American Hinterland.

By L. L. Miller, American Museum of Natural History

[Mr. Miller has not only devoted a great deal of time to exploration in South America in the interest of the American Museum of Natural History, of New York, but he was one of Colonel Roosevelt's famous party that discovered the "River of Doubt." His description of rubber gathering on the Upper Orinoco in Venezuela and along the Machado in Brazil—both visited by him last year—makes a valuable and interesting addition to the contributions on this subject which have already appeared in these columns.]

NEARLY four years of constant exploration and travel in the wilds of South America have taken me into many out-of-the-way places and little-known parts of that continent. Invariably my mission has been a scientific one—to study the fauna and the flora of the region traversed, and a good deal of my time has been spent in the haunts of rubber gatherers—those pioneers of the tropics whose frail crafts are constantly pushing beyond the utmost frontiers of civilization in quest of new fields to conquer, and braving a hundred dangers in their opening up of the dark and silent waterways in the interior of the great, mysterious land. In recent years much has been written concerning the conditions attendant upon the exploiting of rubber lands in parts of South America, some of which is true, a great deal of which is untrue. It is one of the objects of this paper to bring to light some of the interesting phases of the life that is lived in the eternal solitudes of the boundless forests with which I became so intimately acquainted but of which comparatively little is known in general.

It has rarely been my privilege to penetrate into more primitive regions than the headwaters of the Orinoco, or into a land of greater promise than is found along the upper reaches of the Gy Paraná, better known as the Rio Machado. The Gy Paraná, it might be well to state, is one of the largest affluents of the Madeira. For many years its lower course has been known to adventurous seekers of orchids, rubber and other natural products, all of which have been yielded in abundance; but it is only within the last few years that the course of the upper river has been thrown open to navigation of any kind. Even now only an occasional dugout ventures beyond the zone of pestilence and rapids into the land of hostile Indian tribes; but the way has nevertheless been opened, and within a comparatively short time this region will be giving up its fair quota of the natural riches that lie hidden in the vast, untrodden wilderness.

The Orinoco is, no doubt, better known by name than the

Machado, and at present it must suffice to give merely a vague idea of the remoteness of its hinterlands by citing that it requires approximately three months of travel from Ciudad Bolívar, two hundred and forty miles from the mouth of the mighty river, to reach the Rapids of Guajaribo, far above the mouth of the Cassiquaire; beyond that point the river is wholly unknown.

On February 28, 1913, I stopped at the barraca of one

Senor Paraquete, far up on the Orinoco, beyond the mouth of the Ventuari. The main building stood on a high bank thirty feet above the river, and was occupied by Sr. Paraquete and his assistants. Several large rooms were used as a *canta* or store and a fair stock of provisions and merchandise was carried. On one side was the camp of the full-blooded Indian employes, Maquiritaires from the regions of the Cunacunuma, who lived in small palm-leaf huts with their families. On the



SMOKING HEVEA BRASILIENSIS, RIO MACHADO.

other side stood long, thatched buildings, open all around, with scores of hammocks strung from the posts and beams; these were the quarters of the natives—Venezuelans and Zambos. In the rear, and some distance away, stood the smoke-houses, completely enclosed with palm leaves except for one small door opening. Trails led into the forest from a number of points, and numerous dugouts tied to the landing indicated that work was also prosecuted on the other side of the river. Often, especially in the case of the Indians, man and wife worked together. Old-fashioned methods are employed entirely. The trees are girdled with strips of palm pith at the base which intercept the latex and deflect it into a folded leaf placed underneath. This system is rather wasteful and injurious to the trees. There is no fixed rule or custom for tapping the trees, the men hacking into the bark at random, but occasionally the herring-bone pattern of cut is used. Each man has two routes, and endeavors to have from three to five hundred trees on each, seldom more, often less, according to the abundance of the rubber trees in the locality. He takes one trail one day, and the other the next, thus

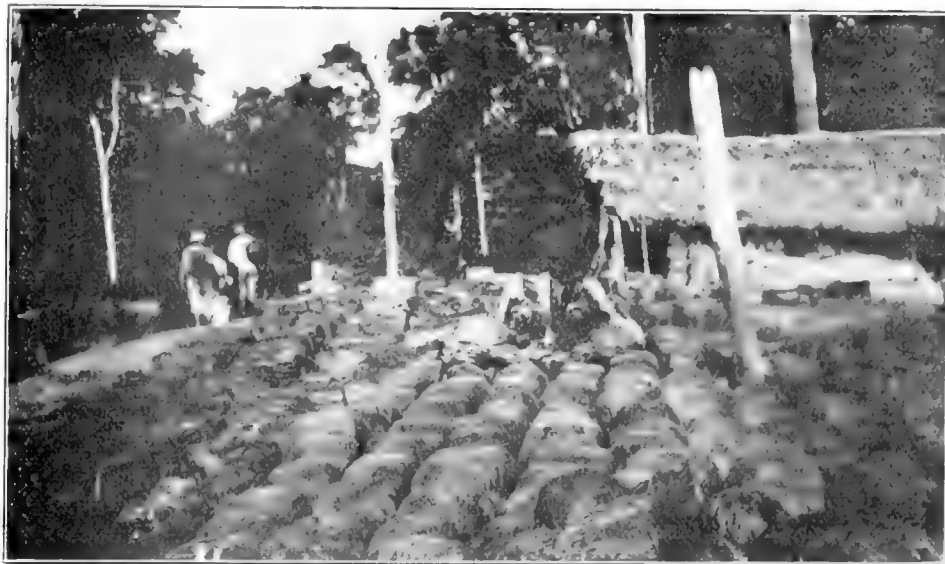
permitting the trees to rest on alternate days. If it rains the day's catch is spoilt, as latex mixed with water is worthless. The season of 1913 had been a poor one; at the beginning the flow was abundant and of good quality, one hundred pounds of latex yielding sixty pounds of rubber. That was in December; by May five hundred trees were producing only twenty-five pounds of milk, and this was of such poor quality that it contained but 40 per cent. of rubber. Of course, the trees had become weakened as the season advanced, which also accounts for the decrease in yield, but the main trouble had been almost constant rains long before the regular wet season. The milk was weighed as brought in by each man at midday and credited to his account; in the afternoon the whole force repaired to the smoke-house to work up the day's catch. A kind of wood called Mazarandul is used exclusively for the smudge; it is of a deep reddish color and grows plentifully along the river.

The cost of transportation between the Upper Orinoco and Ciudad Bolivar is enormous. In the first place, the distance is very great and the river is full of rapids, necessitating long overland portages; all provisions have to be brought up, and the crude product has to be taken back down; there is always a great loss both ways from theft and wreckage, and as there is no regular system of navigation beyond the mouth of the Apure, the difficulties encountered in securing boats and crews are tremendous.

The headquarters of the Orinoco rubber gatherers is San Fernando de Atabapo, containing about a hundred huts, which is the only settlement above the Cataract of Maipures. In February the town was almost deserted. In May it was full of life. Numbers of people were arriving daily; there was dancing and gaming, eating and drinking, day and night, and many a man spent his entire season's earnings in a few evenings. The sight was not unlike that formerly seen in the western mining camps of our own country. Representatives of the big houses in Ciudad Bolivar, which had made advances to the concessioners, were there to see that they received all the rubber collected by their debtors. The governor of the department (Alto Orinoco) made his home further down the river, on the Rio Cataniapo, near the Rapids of Atures. He explained that it was "healthier" on the Cataniapo than at San Fernando, and I subsequently learned just what he meant; but more of this later. All goods going up the river were stopped at his domicile, examined and an *impuesto* collected. There was also a good deal of pilfering of boxes and bales by the light-handed inspectors. Another tax was imposed on all rubber leaving the territory. No wonder that there was great dissatisfaction with the existing regime, and a few days after I left San Fernando the injured parties took a terrible revenge. The governor (Gen. Roberto Pulido) had come up from the Cataniapo and had decreed that not one

ounce of rubber was to leave the district until the tax had been paid in advance. This tax was looked upon as robbery, pure and simple, and it was said, was illegally imposed by the governor for the benefit of his own pocket.

So one night, as Governor Pulido lay ill with fever, his room was entered and he was killed and horribly mutilated. At the same time all the other government officials in the town were treated in like manner and in the riot that ensued the greater part of the male population of San Fernando was exterminated. It was said that Indians had made the attack, but probably the real perpetrators of the deed were a group of the



HUGE BALLS OF CRUDE RUBBER SPREAD OUT TO DRY ON THE UPPER MACHADO.

owners of concessions in that district who objected to what they called open robbery. Personally, I was treated most courteously by Governor Pulido, and he helped in many ways to further my mission. However, there seems little doubt that he drove his methods of extortion too far; this was apparent even in the postoffice, where postage stamps were sold at twice their face value, and if anyone refused to buy them but used stamps purchased elsewhere, there were reasons for believing that the letters never left the building.

The difficulties of travel on the Machado are even greater than on the Orinoco. In eight days we came down a stretch of water that requires three or four months to ascend. The current is terrific; in a large *batelão* we could easily travel eighty kilometers a day. Rapids are numerous, those of San Vicente being the most dangerous. Just before my visit a *batelão* with a crew of thirty-one had gone over, of whom twenty-seven were never seen again. Steam launches, privately owned, now ply between some of the worst rapids and greatly facilitate travel. By their use we covered in one day a distance that had formerly required five months, as the boats had to be dragged around long and difficult portages.

On the Machado the rubber camps are not abandoned during the rainy season but as the floods advance stand isolated above the muddy water, crowded with their human inhabitants, chickens, pigs and dogs. Many of the houses are built on piles, and the water comes up until it touches the floor. As may be expected, the interior is always damp and ill-smelling. Cooking and washing are done on the front porch and canoes are tied to the posts in readiness for instant flight if necessary, or to use in gathering wood or visiting the neighbors. Behind the huts, banana palms bend and bow gracefully as the current tugs at their bases, and a few vultures are usually perched on the roof. The whole presents a scene of devastation, but the people seem perfectly happy. If there is any high country within reach, the men may cut timber and collect copaiba oil or hunt for various kinds of gums. The gathering of Brazil nuts forms one of the chief occupations, and thousands of tons are brought down the various rivers annually. Canoes are hollowed out, palm leaves and poles for new huts are brought in, and every-

thing is made ship shape so that there may be no delay in beginning the rubber season when the water recedes. There are invariably a few men in each camp who are famed for their prowess with gun and harpoon, and it has been my pleasure on several occasions to accompany these nimrods of the tropical jungles on their long rambles in search of meat.

At Calama on the Madeira, just opposite the mouth of the Machado, are located the headquarters of one of the best organized rubber companies I have found anywhere during my four years of explorations. It is the establishment of Asensi & Co., who started business eighteen years ago with eight men; today they employ 3,500 men all told, and produce 700 tons of rubber annually besides large quantities of copaiba oil, tobacco, lumber and other natural products. Their concessions cover the entire country bordering the Machado and Commemoracion, extending inland a distance of thirty kilometers on each side of the water. In addition, the concern controls large tracts on the Madeira. The buildings at Calama are large and comfortable, and besides living quarters include modernly equipped offices, store-rooms, warehouses, carpenter and machine shops and cattle barns. A resident physician is retained for the care of the employes, who are brought down from the camps and cared for when in need of treatment. Each department is in charge of competent officials, and the spirit of co-operation and efficiency is plainly visible even to the casual observer. All steamers plying on the Madeira call at this port, while numbers of the fleet of privately owned launches and other craft are arriving and departing at all hours of the day and night. Provisions in enormous quantities are sent up-river. To reach the farthest outpost, each parcel has to be carried on four different launches, twice on mule back, eight times on men's backs and

five times in canoes and batelaos, a form of transportation at once difficult and time-absorbing.

In the working camps conditions are better than in many other regions. A rigid set of rules has been formed regulating the tapping of rubber trees, with which all tappers are compelled to comply in bleeding the precious *Hevea Brasiliensis*. At first a long handled, narrow-bladed ax is used, which enables the men to make an incision at twice their height from the ground. No tree is touched unless it has a circumference of at least four spans (all measurements are made with the hands, for convenience) and all cuts must be two spans apart, so that if a tree has a circumference of twelve spans, a circle of six spans is made each day. At first these cuts are of too great height above the ground to permit of cups being placed to catch the latex, but they are necessary to stimulate the flow on the sap, which nature intends to cleanse and close the wound so that it may readily heal. To facilitate the healing process the cut is not made at right angles with the tree, but slantingly. Each day a new ring of cuts is made one span below that of the previous day, so that within a week after starting a tree the cuts are within reach and the flow of milk is sufficient to be collected. A small tin cup is pushed into the bark under each incision, into which the sap flows. A short-handled ax is now used and the rows of cuts, one beneath the other, are continued until the ground is reached, when new ones are started just halfway between the old ones, and this is continued indefinitely so that the original openings are not reached again until many years later when they have of course completely healed. The collector starts out in the early morning making the cuts and placing the cups, then he retraces his steps and collects the catch. Should the day be very windy he will probably find that instead of a



LEAVING RUBBER RAfts DOWN THE RIO MACHADO

liquid each cup will contain a neat little white cake of cheese-like consistency; the natives attribute this coagulation of the latex to the action of the wind, but the real cause may be traced to the multitude of small particles of bark and twigs that have fallen into the cup; if the cake be cut open, a great many impurities will be found imbedded in the interior like raisins in a muffin.

Great care must be exercised in smoking the latex of *Hevea*. If allowed to stand too long, the finished product will contain numerous small holes, like a cheese, and will be graded as of inferior quality. If prepared while perfectly fresh, it is smooth and firm and of the best quality. In preparing rubber in the old way—that is by pouring the latex over a paddle and revolving it in a column of smoke until a ball weighing several hundred pounds had been formed—there was always a considerable amount of loss to the producers, and for the following reason. It required the run of many days to produce a ball of this size with the result that on some days the latex was prepared properly and a perfect layer was added to the rapidly growing ball, while on other days the layer added was of a porous consistency. When the ball was finished and cut open for inspection the two qualities showed plainly and the whole ball, including the first-class layers, was classed as *entre-fina* or second quality.

The Asensi company has evolved a method of working up the latex that eliminates all this loss. Instead of the paddle, a wood cylinder nine or ten inches in diameter and a foot wide is used; there are low flanges on the ends, and the whole resembles a shallow spool. After having been smoked the cylindrical piece of rubber is slipped off the form and cut open, resulting in a flat slab. This process possesses many advantages. Each slab represents one day's work for one man; the quality of the rubber is immediately visible, and the surface presented to the smoke is so large that it takes less time to prepare the latex. The flat slabs pack easily and save all the space that is lost in packing the large, unwieldy balls; there is no possibility of mixing the two qualities, and the slabs dry perfectly and cut down the dead weight of water. In smoking the latex of *Hevea Brasiliensis* the nuts of *Attalea Excelsa* are used exclusively for the smudge.

Although there is no scarcity of *Hevea*, *Castilloa* is not overlooked. The trees are cut down and a deep spiral is cut in the trunk; basins are set underneath to catch the sap. That which adheres to the trunk is pulled off in long strips and wound into balls; the milk caught in the basins is coagulated by dropping into it the juice of a vine called "bataatama" and a small quantity of common soap.*

On the Machado I saw an ingenious way of transporting rub-

ber down river from the camps in the interior. Formerly boats had been used entirely for this purpose, which method incurred heavy expense on account of the great weight of rubber. Large crews had, of course, to be maintained for the purpose of looking after the boats, to say nothing of the cost of the boats themselves; now, all this is changed. The rubber is rafted down the stream. A strong rope is passed through the hole in the center of each *bolon* and the ends are then tied together so that they resemble a string of massive beads. A number of these strings are placed one within the other as shown in the photograph. Then a single ball is inserted in the center, with a flag stuck in it, and the "raft" is cut loose. On it floats with the current, slowly where the water is quiet, and dashing madly through gorges and over rapids. Two men follow leisurely in a small dugout, always keeping the bobbing flag in sight. At night they paddle up to the raft and tie a lantern to the flag-pole, then they follow the light. When the floating mass reaches the end of the journey ropes are fastened to it and it is moored at the landing, shed out and prepared for the steamer.

Taken altogether, the life of the rubber collector is one of hardship and deprivations, but it is not without its bright side, and as a general rule is not nearly so bad as often represented. The care-free life and the charm of the boundless wilderness act as a powerful magnet that attracts, year after year, men who know exactly what to expect. We

must also not forget that usually we are judging according to our own standards of comfort and luxury, conditions which do not exist in the regions in question and of which nothing is even known. Life at its best among these primitive folk appears decidedly uninviting to us, but not to them. They are living the life of their fathers, the life that was intended for them and for which they are adapted, and separated from which there would be only discontent and unhappiness.

DR. MANUEL LOBATO RESIGNS EDITORSHIP OF "FOLHA DO NORTE."

The "Folha do Norte" of September 8 contained an announcement of the resignation by Dr. Manuel Lobato, of the editorship of that journal, and an appreciatory notice of his services. Dr. Lobato has also resigned the post he had occupied in the municipality of Para. His name will be recalled in connection with the New York Rubber Exposition of 1912.

PLANS APPROVED FOR NEW BOLSA BUILDING AT BUENOS AIRES

Plans for the new Bolsa Building, to be erected in Buenos Aires, at the corner of Saenz and Corrientes streets, have been approved by the municipality of the city. These plans call for a building of greater height than the old Bolsa, and the city permit, but in view of the rubber boom, the municipality's exception is being made.



INTERIOR OF RUBBER CAMP, PARQUETTE, VENEZUELA

*A complete collection of the various tools and utensils used in its collection and manufacture were presented to the American Museum by Asensi & Co; it is now on exhibition in the museum in the Bronx Botanical Gardens.

THE INTERCONTINENTAL COMPANY'S ANNUAL REPORT.

THE annual report of the Intercontinental Rubber Co., issued on October 5 and covering the year ending July 31 last, states that the company's works at Torreon, Mexico, have been completely shut down during the entire twelve months. The company had some stock on hand at the beginning of the year, which it succeeded in shipping to New York early in 1914, but only a small quantity of this guayule was sold, owing to the low prices. Some sales at better prices were made immediately after the outbreak of the war, but these sales do not appear, of course, in the present report.

The Cedros ranch, owned by a subsidiary of the company, had to be abandoned and left to the mercy of the rebels during the whole year, so that nothing was received from this source.

Two dividends were paid on preferred stock during the year, the last being December 1, 1913, at which date all the outstanding preferred stock was retired for cash, leaving only common stock outstanding at the present time. The company's balance sheet is given below:

BALANCE SHEET—JULY 31, 1914.

ASSETS.

Investments in stock of merged and subsidiary companies:	
By cash	\$2,115,321.59
By stock issues.....	28,198,575.30
	<u>\$30,313,896.89</u>
Patents (exclusive of subsidiary companies)	15,141.77
Accounts and notes receivable, etc.:	
Advances to subsidiary companies	\$661,252.09
Sundry accounts	16,273.51
	<u>677,525.60</u>
Investment securities (market value)	1,065,000.00
Cash	388,573.44
	<u>\$32,460,137.70</u>

LIABILITIES.

Capital stock, common.....	\$29,031,000.00
Accounts payable, taxes accrued, etc.:	
Due to subsidiary companies	\$104,401.65
Sundry accounts	4,791.52
	<u>109,193.17</u>
Reserve accounts	1,124,103.58
Surplus (as below).....	2,195,840.95
	<u>\$32,460,137.70</u>

SURPLUS ACCOUNT.

Surplus, August 1, 1913.....	\$2,197,810.11
Net income from securities, interest, etc. (after adjustment of investment securities to current market value)	\$82,679.19
Sundry income	3,991.72
	<u>\$86,670.91</u>
Less administration and general expenses	35,681.74
	<u>50,989.17</u>
	<u>\$2,248,799.28</u>
Charges against surplus:	
Dividends paid on preferred stock up to Dec. 1, 1913.	\$36,458.33
Reserve against loans to subsidiary companies ...	16,500.00
	<u>52,958.33</u>
Surplus, July 31, 1914.....	<u>\$2,195,840.95</u>

AUTOMOBILE EXPORTS FOR FISCAL YEAR 1914.

ACCORDING to a summary issued by the Department of Commerce, Washington, the aggregate United States exports of automobiles and accessories for the fiscal year ending June 30, 1914, amounted to about 40 million dollars. This amount was apparently composed as follows:

	Number.	Value.
Commercial motor vehicles.....	784	\$1,181,611
Passenger automobiles	29,352	26,616,031
Parts (exclusive of tires) and engines.....		6,787,575
		<u>\$34,585,217</u>
Tires and engines (estimated).....		5,000,000
		<u>\$39,585,217</u>

The analysis of the distribution given below shows that Europe and North America took, respectively, 12¼ and 10¾ million dollars' worth of automobiles and parts, about two-thirds of the grand total of 35 million shown under those heads. Oceania took about 5 million dollars' worth, thus leaving only about 7 million for the remainder of the world, or about 20 per cent. of the aggregate shown by Table A given below.

TABLE A—AUTOMOBILE EXPORTS FOR FISCAL YEAR 1914.

	Commercial motor vehicles.		Passenger automobiles.		Parts. Value.	Total Value.
	No.	Value.	No.	Value.		
Europe	249	\$248,716	13,108	\$10,168,218	\$1,830,560	\$12,247,494
North America...	298	558,413	5,190	6,280,042	3,847,616	10,686,071
South America...	79	130,811	1,906	1,808,401	296,306	2,235,518
Asia	30	55,658	1,408	1,206,031	144,017	1,405,706
Oceania	113	171,407	4,833	4,338,977	334,956	4,845,340
Africa	15	16,606	1,861	1,591,294	170,777	1,778,677
Hawai			701	841,458	85,813	927,271
Porto Rico			291	320,680	70,025	390,705
Alaska			54	60,930	7,505	68,435
	784	\$1,181,611	29,352	\$26,616,031	\$6,787,575	\$34,585,217

AUTOMOBILES AND PARTS EXPORTED TO BELLIGERENT NATIONS.

Aggregate exports to Europe were \$12,247,494, of which the value of nearly eleven million dollars was shipped to the nations which have since become belligerents, in the following proportions:

TABLE B—AUTOMOBILE EXPORTS FOR FISCAL YEAR 1914 TO NATIONS NOW BELLIGERENT.

	Commercial motor vehicles.		Passenger automobiles.		Parts. Value.	Total Value.
	No.	Value.	No.	Value.		
England	203	\$189,099	7,017	\$5,662,435	\$1,305,657	\$7,157,191
Germany	24	18,462	1,411	1,040,787	213,351	1,272,606
France	2	5,070	1,427	919,060	179,351	1,103,481
Russia	2	5,322	926	898,458	14,079	917,859
Austria-Hungary ..	3	7,455	314	190,199	5,198	202,852
Belgium			244	139,681	20,978	160,659
Belligerent nations.	234	\$225,408	11,339	\$8,850,620	\$1,738,614	\$10,814,648
Other European nations ..	15	23,308	1,769	1,317,598	91,946	1,432,846
Grand total Europe.	249	\$248,716	13,108	\$10,168,218	\$1,830,560	\$12,247,494

Thus about seven-eighths of the United States exports of automobiles and parts for the fiscal year 1914 were to nations now at war.

Most interest attaches at present to the South American market, as being practically the only large outlet free from any connection with present or prospective hostilities.

TABLE C—AUTOMOBILE EXPORTS TO SOUTH AMERICA (FISCAL YEAR 1914).

	Commercial motor vehicles.		Passenger automobiles.		Parts. Value.	Total Value.
	No.	Value.	No.	Value.		
Argentina	48	\$65,225	940	\$963,586	\$92,633	\$1,121,444
Brazil	13	20,449	299	264,992	84,602	370,043
Chile	2	10,743	195	160,194	22,405	193,342
Uruguay	1	865	183	167,269	21,401	189,535
Venezuela	12	28,228	126	102,073	36,386	166,587
Colombia			79	69,620	19,970	89,590
Peru	3	5,301	36	31,362	5,982	42,645
Ecuador			21	21,229	6,324	27,553
Bolivia			4	12,764	1,209	13,973
British Guiana			16	11,364	4,583	15,947
Dutch Guiana			7	3,948	911	4,859
	79	\$130,811	1,906	\$1,808,401	\$296,306	\$2,235,518

What the Rubber Chemists Are Doing.

SYNTHETIC RUBBER.

IN the September number of this journal an article appeared entitled "War Prices Will Start Synthesists Again." While there are no direct results in this line from the war, yet quite a little has been done lately, and the remarks of Sir William Crooks a short while ago in his presidential address, delivered before the Society of Chemical Industry, show that this eminent authority recognizes the value of the scientific work done in this line. Dr. Crooks said in part: "Recent work on the synthesis of rubber has attracted much attention and notable advances have been made. As long ago as 1882 Tilden noticed that isoprene was converted into rubber by certain chemical reagents; ten years later he showed that this product was capable of vulcanization. Subsequent work led to the recognition of the fact that most substances containing a conjugated double linkage tend to polymerize, the polymers ranging from sticky substances through well-defined rubbers to hard resins. Polymerization may be spontaneous or it may be brought about by reagents, acids or alkalies, by heat or by sunlight."

In 1908, C. Harries and F. E. Matthews simultaneously discovered that metallic sodium is an excellent reagent for the polymerization of isoprene. The action is practically quantitative and not affected by impurities. Moreover, it takes place in the cold or by only moderate heating.

Professor Harries showed that a superior product could be obtained by the polymerization of butadiene. Research showed that isomyl-alcohol obtained from fusel oil was a most suitable material to work on. By means of dry hydrochloric acid gas it was converted into chloride, then chlorinated to give the double chloride, from which the hydrochloric acid was eliminated by passing over hot soda lime. The isoprene so formed was then sealed up with 3 per cent. thin sodium wire and heated for several days to 60 degrees. The dark brown product thus formed was treated with acetone to precipitate the rubber. To obtain the fusel oil Fernbach has worked out a new process of fermentation starting with starch.

Holt has recently made some valuable discoveries relating to the manufacture of isoprene from the pentanes found in petroleum oil, and the preparation of butadiene from benzine or phenol, tetra hydro-benzine being formed as an intermediate product. He has also observed that when isoprene is treated with sodium in an atmosphere of carbonic acid gas it gives quite different products from those obtained by the same action in air.

Recent work shows that all synthetic caoutchoucs differ chemically from the natural rubber. Physically they are only equal to medium grade natural rubbers.

The above indicates that the most eminent chemists think commercial synthetic rubber within the range of probability, though it has not yet arrived.

TWO PATENTS CONTROLLING THE USE OF ANILINE DYES IN RUBBER

On October 13, 1914, the United States Patent Office issued two patents covering the use of aniline dyes in any rubber compound which is to be afterwards hot cured. The first of these, No. 1,113,614, is issued to Kurt Gotleib, and the second, No. 1,113,759, is issued to Rudolph Ditmar, both of whom assigned their patents to the Bayer Co., of Elberfeld.

It is rather curious that these two patents should be identical in wording throughout except in mentioning different dyes, and that both should be issued while one controls the other. One covers organic dyes and the other organic vat dyes.

In THE INDIA RUBBER WORLD of February last mention was made of some work contributed by Ditmar on the use of dyes of this class which these patents now cover. Should these claims be upheld they would cover the entire field of the use of organic dyes which can be mixed in while compounding and will stand the vulcanizing temperature, and no colored rubber made in this way could be put on the market without the consent of the patentees. It would appear, however, that the use of these dyes in this way has been known before.

Referring to the 1909 Edition of Pearson's "Crude Rubber and Compounding Ingredients" we find on page 173 the following: "These aniline colors being soluble in benzine can be mixed right with the india rubber. If the product be cured in open steam heat with sulphur some curious effects are likely to be obtained." This certainly discloses a method of mixing organic dyes and sulphur with rubber and curing with open steam heat.

SOME OTHER RUBBER PATENTS

United States Patent No. 1,113,630 has been issued to Fritz Hoffman, who assigns to the Bayer Co., of Elberfeld. This claims the production of caoutchouc by polymerizing butadiene with urea.

David Spence and William I. Russell have just been granted United States Patent No. 1,112,938 which claims the use of metallic or caustic alkali metals for improving the qualities of low grade rubbers. The patent is assigned to the Goodrich company. This corresponds to the British patent No. 17,667 for the same thing.

The use of sodium or other alkaline metal for the polymerization of isoprene according to the Harries method is of course well known, but it has hitherto not been applied to the improvement of low grade natural rubbers. The use of an alkaline earth has been proposed many times for desinizing low grade rubbers and it will dissolve many resins.

The use of the metals or their derivatives is also claimed to improve reclaimed rubber. Of course it would not seem that the use of caustic soda on a rubber reclaimed by the alkali process could have any further effect than the alkali with which it was reclaimed, but the use of metallic soda might affect it favorably. With the increasing production of plantation rubber the low grades and their improvement will become of less importance.

GERMAN RUBBER CHEMIST ARRESTED IN RUSSIA

Like all other "hostile aliens" the lot of the chemist caught in foreign countries now at war is a hard one and subject to dangers from the hysterical condition of the people. An English journal states that a German chemist at Petrograd, named Keller, who was employed by the Russian-American India Rubber Co., has been arrested. It is reported that a few months ago wholesale cases of mysterious poisoning occurred in various works in Petrograd and elsewhere in a number of rubber plants. A search of Keller's lodgings is said to have disclosed compromising papers and chemical compounds producing effects similar to those experienced by the workmen who were poisoned.

The probabilities are that the subtle police have got hold of his compounding formulas for rubber and, as these seem mysterious, they are likely to be regarded as some strange poison intended to exterminate the entire Russian nation; and probably the unhappy chemist will prove another victim to the excited state of the public mind in these times of war.

THE USE OF SODIUM BI-SULPHIDE IN COAGULATION OF LATEX.

Dr. H. P. Stevens stated at the International Congress of Tropical Agriculture, that sodium bi-sulphide was used to make pale crepe plantation rubber, as this was preferred by many users. Only what might be called a trace of this compound was added to the latex before coagulation and this was quite a different thing than adding large quantities to crude rubber which had been proposed elsewhere. To prove whether this addition was deleterious or not a sample of plantation was prepared with the addition of a small quantity of the sodium bi-sulphide to the latex and another was prepared without the same addition.

Both these samples were sent to a cable manufacturing company for trial and the test showed that the sample containing the bi-sulphide was if anything better than that prepared without it. To confirm this another set of samples was compared and a like result was obtained. Therefore it was concluded that the addition of sodium bi-sulphide was beneficial rather than otherwise in the coagulation of latex.

ISOLATION OF THE INSOLUBLE CONSTITUENTS OF CAOUTCHOUC.

Bernstein in the "Kolloid Zeitung," Vol. 15, page 49, comments on the work of Spence and Kratz which we reported in the October issue of this publication.

He states that the method they used is not novel in so far as it depends on the reduction of the viscosity of a rubber solution to enable one to separate the insolubles from the rubber. Diminution of viscosity may be produced by other means than that used by Messrs. Spence and Kratz. For example this may be accomplished by the use of acids, and sulphuric acid has been used for the estimation of caoutchouc in crude rubbers. Compare Marquis and Heim, A. 1913, page 884.

ASBESTOS PACKINGS.

Experience has lately shown that inquiries for asbestos stuffing-box packings have been at such low prices as to preclude the delivery of reliable articles, even where the percentage of cotton was a minimum one. Investigation disclosed the fact that the asbestos filling was in many cases heavily loaded with weighting substances, in order to reduce the cost. Asbestos is not of itself an expensive product, but, according to German experts, there are fillers 70 per cent. cheaper than asbestos and even still cheaper.

The question, however, has arisen of the effect of this packing on the piston rod, in producing heating, with the result that the machine is put out of operation until repaired. Such bad packings may cause a permanent injury to the reputation of factories, thus opening the way to competing products.

With a view to eliminating this difficulty, it has been suggested in Germany that manufacturers and dealers should combine in producing a quality of packing with a guaranteed percentage of cotton yarn and a good quality of asbestos. Such a quality corresponds with that delivered to railways by large factories. Hence it has been suggested to call this article the "Railway" quality, by which a distinctive grade would be indicated, the delivery of an adulterated quality being made a punishable offense.

Asbestos packings are sometimes delivered "Double Spun," but this is only found necessary with railway packings over 17 m.m. (0.67-inch) in diameter. For packings of smaller diameter, "Single Spun" is found sufficient for both railways and other consumers.

THE CONSUMPTION OF ANTIMONY.

In 1913 the United States consumed 12,755 tons of metallic antimony with a value of \$1,828,967. Of this amount there was 1,000 tons of oxides and salts valued at \$117,000.

ENGLAND SHIPPING CHEMICALS.

The restrictions which the British government placed on the export of chemicals at the outbreak of the war have been removed to some extent, and firms in the Manchester district are now in a position to fill reasonable orders for such supplies. The list of obtainable chemicals includes the following of interest to rubber manufacturers: Acetone; antimony salts, 45 and 75 per cent.; barytes, sulphate of all qualities, free from lime and suitable for all purposes; carbonate of magnesia; lithopones; tetrachloride of carbon; zinc, sulphate of; zinc oxide; chloride of barium; glycerine; rosin, and wax.

OZOKERITE IN UTAH.

According to a report of the United States Geological Survey, which has been making an investigation of the possibilities of this country in the way of producing articles hitherto obtained from Europe, ozokerite, or natural mineral wax, occurs in considerable quantity in Utah. The market for this product being largely in the Eastern States, the cost of production and transportation to such points has made it impossible to compete with the imported product, which came from Galicia. It is possible now, however, that interest may be taken in the development of the industry in this country.

RUBBER NOW ON THE CONTRABAND LIST.

A British decree proclaimed on September 21 places several additional items, including rubber, on the list of objects and materials held as conditional contraband by that country. Under dates of September 8 and 25 additions were also made to the list of articles of which export has been prohibited. Aeroplanes, airships and balloons of all kinds and their component parts are prohibited export to any destination whatever; while india rubber sheet, vulcanized, and rubber, raw, are prohibited exportation to certain countries, namely, to all foreign ports in Europe and on the Mediterranean and Black Seas, with the exception of those of France, Belgium, Russia (except the Baltic ports), Spain and Portugal. Late in October crude rubber became unconditionally contraband, shipment from any English port being prohibited.

On October 3 the French Government declared crude rubber and automobile tires contraband, the order covering "leather, pneumatic and other automobile tires and the raw products from which they are manufactured." This order has evidently been somewhat modified, however, and permission granted for the export of certain rubber products as, for instance, all tires made by the Gaulois company at Clermont-Ferrand, France, except solid tires, which are being turned out for the government at the rate of 400 a day. Export of Gaulois tires to the New York branch of this company is said to have been resumed.

The Russian Government has also prohibited the export of rubber and rubber tires, but this government is prepared to authorize, without any formality, the exportation of such prohibited goods as may not be required in Russia, in British or Allied vessels, if the port of destination is a British or Allied port. If the destination be a neutral port, permission will be granted only if the Embassy or Legation of the neutral country in which the port in question is situated certifies in agreement with the Embassy or Legation of the Allied country under whose flag the vessel sails that such prohibited goods will be unloaded in a neutral country and will not be re-exported to the country of an enemy.

The list of articles which Germany and Austria propose to treat as conditional contraband was made public on September 18 and includes, in addition to crude rubber, waste and substitutes, balloons and flying machines and their distinctive component parts and accessories intended for use in connection therewith.

The Testing of Balloon Fabrics.

By R. A. D. Preston

TESTING balloon fabrics may be considered as comprising first the routine testing of the fabric and its component parts during manufacture, and secondly testing of a research nature to determine the behavior of the fabric under special conditions. The principal routine tests made at the Goodyear Tire & Rubber Co. are tensile tests and resin determination of rubber to be used in the proofing compound, tensile and stretch test and determination of sizing in the unproofed cloth and tensile and permeability tests of the finished fabric. The specifications of a balloon fabric usually consist of maximum weight and maximum permeability to gas per unit of area and minimum tensile strength per unit width in the direction of warp and weft of the principal ply of fabric (in case of "bias" fabric).

Considering these in the order named, a sample of the rubber

is washed with special care, dried, compounded to a standard formula and a specially shaped sample mold-cured and tested for tensile strength, stretch and set on the H. W. Cooley machine (Fig. 1) which registers a graph of these properties. The resin content is determined by extracting with acetone, using the well-known underwriters' apparatus.

Tensile and stretch tests of the unproofed cloth are made on the Olsen fabric testing machine (Fig. 2). The standard sample dimensions for warp and weft strength have been the subject for considerable study. Test pieces 2 inches wide and 7 inches long are cut carefully with their length parallel to the warp and weft respectively. Three tests are made in each direction and

strength, the difference between dryness and saturation often reaching 40 per cent. of the normal strength.

The bare cloth is also tested for traces of starch sizing by boiling out a small sample in distilled water and testing the solution with iodine. Any appreciable quantity of sizing prevents the proper impregnation of the fabric on the spreading machines.

The strength and stretch of finished fabric is determined in the same manner as in the case of the bare cloth. Considerable



FIG. 1. COOLEY RUBBER TESTING MACHINE.



FIG. 2. OLSEN FABRIC TESTING MACHINE.

attention has been given to tests of fabric seams and standard specifications have been adopted which make the joint stronger than the fabric itself.

The most interesting and practically the only test in the series for which special apparatus other than that customarily used in the rubber and textile industries is required, is that for permeability to gas. Although illuminating gas is nearly always used for spherical balloons, the permeability of balloon fabric is expressed in volume of hydrogen (the gas exclusively employed for the inflation of dirigible balloons) which under specified pressure (usually the equivalent of 2 inches water) will leak through a unit area of the fabric in 24 hours.

There are several methods of determining hydrogen diffusion. That of most historical interest is the Renard-Surcouf balance. The apparatus consists essentially of an ordinary balance to one arm of which is attached a bell jar dipping into a water tank. Across the top of the jar the test piece is held by two metal rings with a rubber gasket, the whole being well bolted together. The bell jar is fitted with connections so that pure hydrogen may be passed through it. This is done until the air is eliminated. The bell jar is then weighted to give the desired pressure, when the stop cocks are closed and connections detached, balanced with weights on the other arm of the balance and allowed to remain 24 hours. Due to diffusion of hydrogen through the test fabric, the equilibrium will be destroyed and the bell jar will drop slightly. This will be indicated by the balance pointer, and with proper corrections expresses the leakage per 24 hours.

Another apparatus somewhat used in France is that of Josse. From the sketch (Fig. 3) it will be seen the essentials are a

one-half the average value of the breaking load taken as the tensile strength per inch. That this width sample gives the most representative value of tensile strength is confirmed by tests on specimens of varying width and length made at the English National Physical Laboratory. In making tensile tests of fabrics it is desirable to keep the samples for several days in a room of constant relative humidity (usually 65 per cent.). The amount of moisture in the fabric considerably influences its tensile

metallic box (2) surrounded with a water jacket to maintain constant temperature of the gas, provided with a flanged top (1), and ring and gasket arranged to hold the test piece. The bottom of this box is fitted with a glass graduated tube (7) which extends to the bottom of a concentric glass cylinder (8). There are two connections in this graduated tube, one to pass hydrogen into the box and the other a "U" tube (4) to register the gas pressure. Connected by a tube with pinchcock to the bottom of the concentric cylinder is a bottle (6) holding a volume of water equal to that of the graduated tube. The procedure is as follows: The fabric is first tested for impermeability to air by closing the valve (5) maintaining a constant pressure in the "U" tube by raising the bottle to the necessary height and noting if the level of the water in the graduated tube remains constant. If the fabric holds air it is then tested for hydrogen diffusion. Hydrogen is passed through the box under the fabric until the air is completely swept out (test burning of test tube of gas from "U" tube). The valve (5) is then closed and the loss of gas in a given time measured by the rise of water in the graduated tube necessary to maintain the stated pressure in the "U" tube.

The principal disadvantage of these types of apparatus is that their accuracy is dependent largely on the tightness of the drums or bell jars and connections, of which, due to necessary laboratory refinements, there are many; and that account must be taken of the diffusion of air into the drum.

The method used in the laboratories of the Goodyear Tire & Rubber Co. is to maintain a constant pressure of hydrogen on one side of a test piece of fabric while air is passed by the other side, taking with it the hydrogen which has diffused through the fabric, which hydrogen is burned to water in a combustion furnace and weighed, giving with a simple calculation the leakage of the fabric over a definite time interval. With this apparatus the only joint under appreciable pressure which must be kept tight is that between the fabric and the bottom half of the drum.

The technique of the test is as follows: The two hemispheres of the bronze diffusion drum (6) (Fig. 4) are opened and the balloon fabric diaphragm (7) to be tested is inserted, the two halves of the drum being then bolted together so securely that the joint is gas tight. The drum is then placed in a thermostatic bath (not shown in diagram) and brought to the required temperature, usually 20 deg. C.

When the drum and its contents have attained the desired temperature, hydrogen is allowed to pass from the cylinder (1) through the gas washing bottle (2) filled with strong sulphuric acid for drying the hydrogen, thence through the preheating furnace (3) whose purpose is to burn all organic gaseous impurities in the hydrogen and to combine any contained oxygen with it to water; the purified gas then passes through the gas washing bottle (4) filled with caustic potash solution to remove traces of carbon dioxide, etc., and then through the bottle (5) filled with strong sulphuric acid to remove the last traces of water, thence into the under side of the diffusion drum (6).

The purified hydrogen gas is passed into the lower half of the drum (6) and out through the tube (15) until all the residual air contained in this lower half has been displaced by hydrogen and swept out. The tube (15) is then closed and the pure hydrogen allowed to diffuse upward through the diaphragm for a definite time.

The hydrogen diffusing through (7) into the upper half of the drum (6) is swept out by a current of air admitted through the tube (14). The hydrogen containing air passes through the gas washing bottles (9 and 10) whose purpose it is to remove any adventitious moisture, they being filled with strong sulphuric acid; thence the gases pass into a heated combustion tube (11) filled with platinized asbestos, where the hydrogen is burned to water, which in turn is absorbed and weighed in the Geissler bulbs (12 and 13).

No. 8 is a pressure regulating device whose function is to maintain a constant gas pressure in the lower half of the diffusion drums, the pressure usually equaling a 2-inch column of water.

Knowing the exposed area of the diaphragm, the time of diffusion, and the weight of the water obtained by the combustion of the diffused hydrogen, a simple calculation enables us to determine the diffusion per square yard in 24 hours, and results are always reported as cubic feet of hydrogen diffused per square yard in twenty-four hours at the given constant temperature and pressure.

The apparatus of Professor Heyn in use at the Imperial Testing Laboratory Gross Lichterfelde (near Berlin) is essentially similar to the Goodyear equipment, except that the test piece is much smaller (about 4 inches against 9 inches diameter) and no provision (unless this has been done recently) made

for maintaining uniform temperature of the gas and fabric. It has been shown with the Goodyear and other apparatus that temperature has a marked effect on the diffusion rate.

The apparatus thus far described measures the amount of hydrogen which has diffused through the fabric during a given period. An instrument on an entirely different principle has been developed recently in Germany with which it is possible to read directly the rate of diffusion. This is the

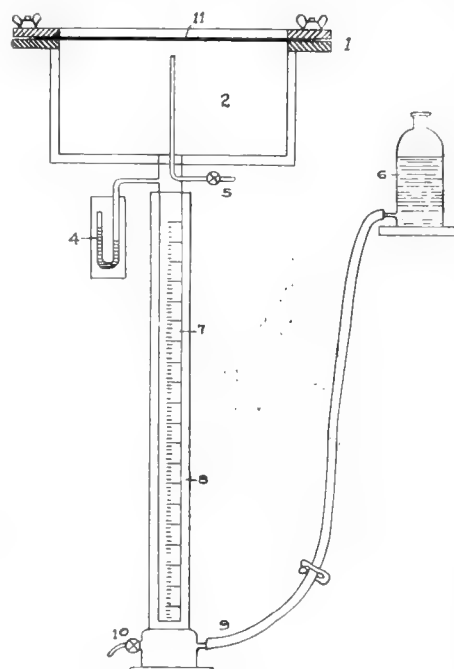


FIG. 3. JOSSE'S APPARATUS FOR TESTING THE PERMEABILITY OF FABRIC TO GAS.

gas interferometer made by the firm of Carl Zeiss, Jena.

The principle of the apparatus is briefly as follows: The upper part of a pencil of light rays made parallel by a collimator passes through the upper halves of two narrow vertical slits in the objective of a telescope. Half the lower part of this pencil passes through one of two gas chambers between the collimator and the telescope and the other half through the other. These two sets of rays from the gas chambers pass through the lower part of the above mentioned slits in the objective. If one of the gas chambers is filled with pure air and the other with a mixture of air and hydrogen, on looking through the eye piece of the telescope the lower interference spectrum will be displaced with respect to the upper (whose rays do not pass through the gas chambers). By turning, by a micrometer screw, a series of prisms placed in the path of one of the lower sets of rays, the principal dark lines in the two spectra can be brought together. The number of divisions through which the screw is turned is a measure of hydrogen content of the hydrogen and air mixture. In practice air from above a test piece of fabric (and therefore containing hydrogen diffused through the fabric) is drawn at a known constant rate through the gas chamber of the interferometer while the other chamber is filled with purified air. The test piece is held in a drum essentially similar to that in the Goodyear apparatus. The instrument is calibrated by

observing the readings using known mixtures of CO₂ and air and correcting for the difference in indices of refraction of CO₂ and hydrogen or using directly mixtures of hydrogen and air, the former method being easier to apply in the laboratory.

Tests to determine the variation of diffusion with temperature and pressure show the diffusion rate to vary directly with the temperature within practical limits and to increase with increase in pressure but not proportionally, increments in permeability decreasing with increase in pressure. For a given temperature and pressure the permeability increases until the

In the last quantity the water pressure and temperature vary somewhat with different testing plants. A good spherical balloon fabric obtainable in this country has a weight of 7¾ ounces per square yard, strength (one ply on bias) of 40 pounds per inch, and a diffusion of 0.4 cubic feet. Two characteristic dirigible balloon fabrics have weights of 9 and 14½ ounces per square yard respectively, strengths of 90 and 130 pounds per inch, and diffusion rate of from 0.2 to 0.25 cubic feet. The first is two ply and the other three-ply parallel doubled fabric.

In addition to the routine work many research tests have

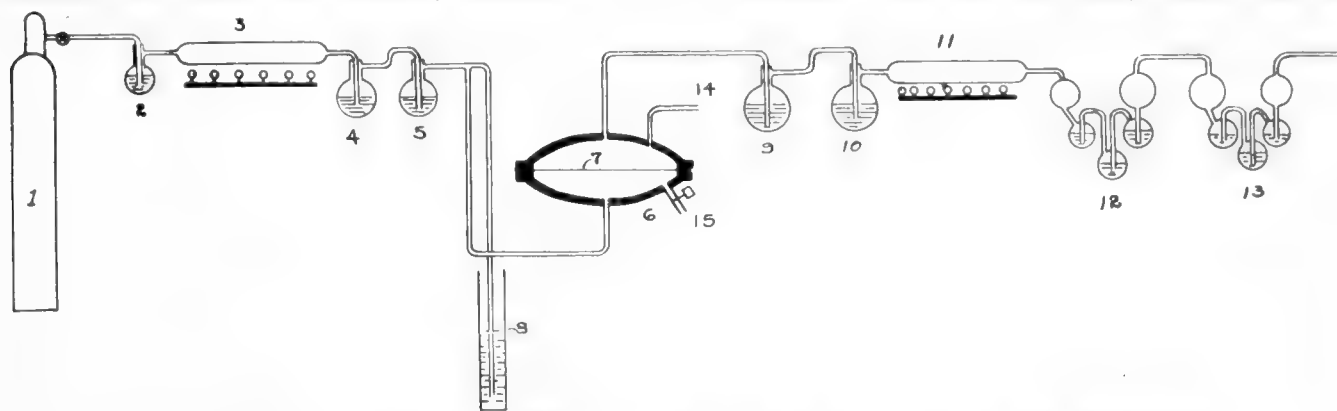


FIG. 4. APPARATUS USED BY THE GOODYEAR COMPANY TO TEST THE PERMEABILITY OF FABRIC TO GAS

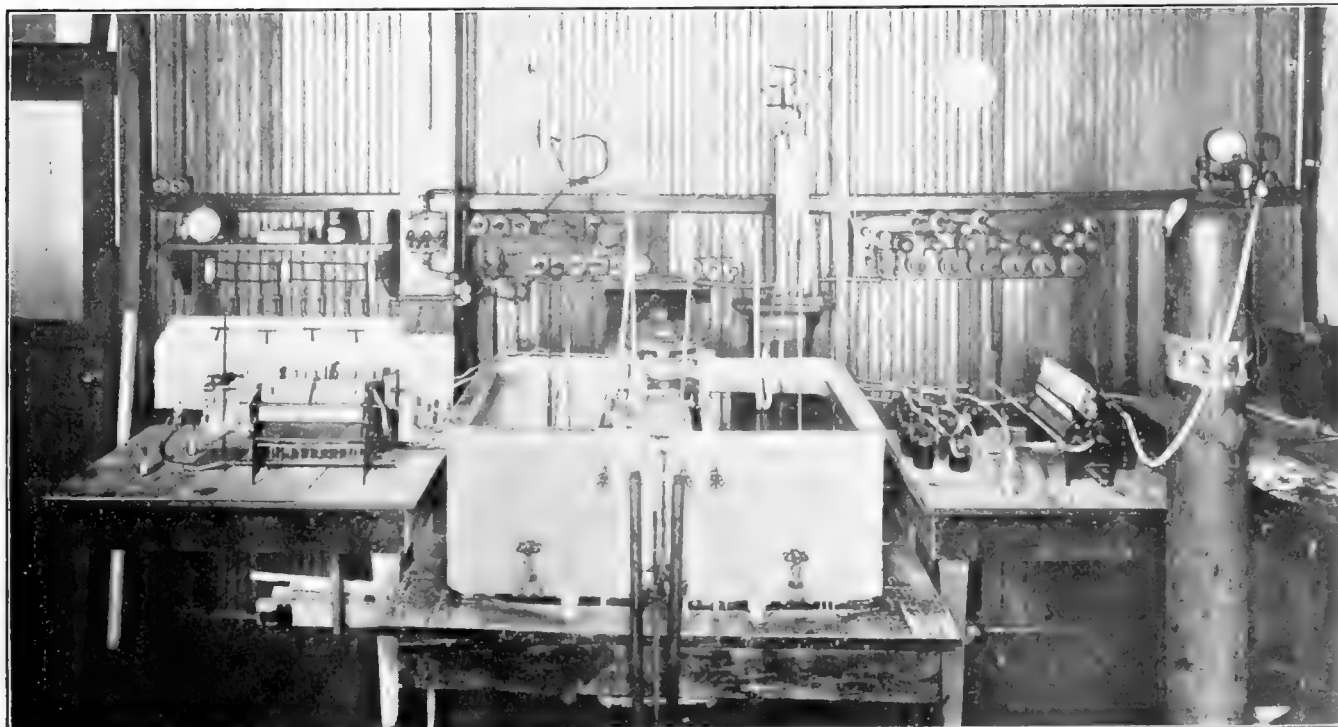
fabric becomes saturated with hydrogen, then remains practically constant.

The units used in expressing results of the tests described are

Test.	English.	Metric.
Tensile strength.....	Pounds per inch.	Kgm. per meter.
Weight	Ounces per sq. yd.	Gms. per sq. meter.
Hydrogen diffusion...	Cubic feet per sq. yd. per 24 hours at 2 inches water pressure and 15 deg. (or sometimes 20 deg.) C. at 29.92 inches barometer.	Liters per sq. meter per 24 hours at 50 mm. water pressure at 15 deg. C. and 760 mm. barometer.

been made, utilizing for the most part apparatus already described, to determine, for example, the properties of balloon fabrics under such special conditions as compound stress, varying weather exposure, extremes of temperature; the relation of rate of diffusion to temperature and pressure of the gas, the increment of weight due to rain, etc.

An interesting series of tests has been made on the elasticity and ultimate strength of balloon fabrics under compound stress at the National Physical Laboratory in England. The test specimen was a cylindrical surface of the fabric 5 inches diameter by 12½ inches long fitting over metal end pieces so formed that the surface and ends as a whole can be placed in a testing machine for the application of a longitudinal tension, while one of the ends connects with an air supply for internal pressure.



HYDROGEN DIFFUSION APPARATUS USED IN THE CHEMICAL LABORATORY OF THE GOODYEAR COMPANY

and the other carries a ball thrust washer, so that no torsional stress of the bag as a whole can occur. The conclusions of the series of tests may be briefly stated.

1. For any single or double parallel woven fabric under compound stress the stresses in the fabric parallel to the warp and weft are independent.

2. A method is developed of computing the ultimate strength of a double diagonal cotton fabric under compound stress from simple tensile tests.

3. For a fabric under compound stress each of the two strains is a function of both stresses.

The Germans have with characteristic thoroughness worked out in detail the action of fabrics under compound stress. Preliminary to the design of the Siemens Schuckert dirigible, a large number of such tests were made using apparatus essentially similar to that above described. These are well described in Hass & Dietz's *Stoffdehnung und Formänderung der Hülle von Prall Luftschiffen* (J. Springer, Berlin).

Besides tensile and diffusion tests (the latter with Prof. Heyn's apparatus), bursting tests of considerable interest have been made at the Imperial Testing Laboratory (near Berlin). The apparatus is so arranged that any desired air pressure can be impressed against the under side of a circular test piece and a graph of rise of the center of the fabric surface and pressure obtained. A series of tests to determine the effect on apparent bursting strength of varying sample diameter and the relation between strength determined from the bursting test and tensile tests showed about 10 per cent. decrease in strength in sample diameter increase from 11.3 to 50.5 cm. and tensile test strength about 66 per cent. that of the bursting test. It must be noted that the fabric used was two-ply diagonally doubled fabric. On parallel fabric the tensile test strength would probably be higher than the bursting strength.

Another series of tests made at the National Physical Laboratory furnished valuable data on the effect of weathering on the permeability and tensile strength of several varieties of balloon fabric. Samples for both these properties were tested after 24, 48, 72, 96, 120 and 144 days' exposure. The most important conclusions are: (1) Fabrics deteriorate more when exposed to moisture and light than to light alone; (2) the coloring yellow of the outer cotton layer is clearly beneficial; (3) just before the fabric finally disintegrates its permeability is temporarily greatly improved (this indicates that a marked improvement in the gas tightness of an old balloon should be viewed with suspicion); (4) in most cases the decrease in tensile strength after 100 days' exposure is 30 per cent. or over. Tests in the Goodyear Tire & Rubber Co. laboratory tend to confirm the first, second and fourth of these conclusions.

Tests from the same source (N. P. L.) of fabrics after subjection to temperatures of -15 deg. C. and -25 deg. C. showed practically no effect of the former and a considerable increase in leakage due to the latter temperature. Tests for increase of weight due to water adherence showed about 10 per cent. for fabrics rubber coated on the outside and 20 per cent. for fabrics having cloth on the outer surface.

A series of tests to determine the transmission of heat through various types of balloon fabric was made in the Goodyear laboratories. It was found that the color of the inside of the fabric had comparatively small influence on the radiation. The influence of "slicing" the outside was also small. The fabric with yellow exterior and dark brown interior coating seems on the whole most satisfactory. In this manner is made the standard Goodyear balloon fabric.

MONOGRAMMED TIRES.

Automobile tires are now being made with the owner's monogram or initials molded into the casings, one company advertising that its New York branch will accept orders for tires made in this way.

MANY NEW MEMBERS FOR THE RUBBER CLUB.

AT the meeting of the Executive Committee of the Rubber Club of America, held at the Union League Club, New York, October 13, the following members were elected:

FIRM MEMBERS.

American Hard Rubber Co., James F. Giles.
11 Mercer street, New York.
H. A. Astlett & Co., E. R. Hawkins.
117 Pearl street, New York.
A. W. Brunn, A. W. Brunn.
Produce Exchange Annex, (Changed from active membership.)
New York.
Endurance Tire & Rubber Co., Wilson G. H. Randolph.
1789 Broadway, New York.
Earle Brothers, R. W. Earle.
66 Broad street, New York.
W. R. Grace & Co., W. E. Byles.
1 and 2 Hanover Square, New York. (Changed from active membership.)
Kelly-Springfield Tire Co., Van H. Cartmell.
227 West 57 street, New York.
L. Littlejohn & Co., Wm. E. Bruyn.
129 Front street, New York.
Goodyear Tire & Rubber Co., P. W. Litchfield.
Akron, Ohio.
Johnstone, Whitworth & Co., J. T. Johnstone.
140 Pearl street, New York. (Changed from active membership.)
Obalski & Sweeney, Edward C. Sweeney, Jr.
24 Stone street, New York. (Changed from active membership.)
Reading Rubber Mfg. Co., William H. Marland.
Reading, Massachusetts. (Changed from active membership.)
Republic Rubber Co., Thomas L. Robinson.
Youngstown, Ohio. (Changed from active membership.)
William H. Stiles, William H. Stiles.
97 Water street, New York.

ACTIVE MEMBERS.

Lloyd E. Appleton, F. H. Appleton & Co., 5 East 42nd street, New York.
Edward H. Huxley, United States Rubber Co., 1790 Broadway, New York.

ASSOCIATE MEMBER.

John W. Coulston, J. W. Coulston & Co., 80 Maiden Lane, New York.

The resignation of one associate member was accepted. The summary of membership is now as follows:

Honorary	3
Firm	83
Active	204
Associate	58
Total	348

RESOLUTION PASSED BY THE EXECUTIVE COMMITTEE OF THE RUBBER CLUB OF AMERICA AT ITS MEETING HELD AT THE UNION LEAGUE CLUB, OCTOBER 13, 1914.

Whereas, the Executive Committee of the Rubber Club of America recognizes the importance of the Census of Manufactures which the Federal Bureau of the Census is required to take every five years, and as this census will be taken next year covering figures for the year 1914, it is hereby

Voted that the Executive Committee of the Rubber Club of America would recommend to all rubber manufacturers in the United States that they give their hearty co-operation to the Director of the Census in order that the statistics from the rubber industry may be accurate and complete.

PROTEST AGAINST MAKING RUBBER CONTRABAND.

The Rubber Club of America and the Rubber Trade Association of New York, recently organized by the rubber importers, are both considering entering a protest with the State Department at Washington against England's action in placing crude rubber on the list of absolute contraband.

THE INDIA RUBBER WORLD has also been appealed to by a number of individuals and corporations connected with the rubber industry to lodge a similar protest with the State Department.

The Editor's Book Table.

RUTHERFORD'S PLANTER'S NOTE BOOK. SIXTH EDITION, 1914.
The Times of Ceylon Co., Ltd. Colombo and London. [8vo, Pp. 478.]

THIS work, first issued (in 1887) for the benefit of Ceylon tea planters, has been expanded to cover all branches of tropical agriculture. The fifth edition having been sold in a week, a sixth is now on the market. It is still distinctly a work for Ceylon planters, though tea is now only one of the many crops comprehensively treated. While the information relates particularly to matters peculiar to Ceylon, there is much of interest to planters in all tropic lands and the whole work is full of curious enlightenment for the general reader. It is intended as a *vade mecum* for the Ceylon planter, treating of all the operations of the plantation from jungle clearing to bookkeeping and from digging out cocoanut beetles to capturing wild elephants. An endless variety of mathematical tables is presented to save time and give accuracy to the planter's estimates.

Of course, the most radical difference between planting in Ceylon and those operations in which most of the readers of this publication are interested is that dealing with the labor problem. It is assumed that every laborer is a "coolie," the number of coolies required is so and so, and the amount of work which can be done is so much "per coolie." The legal regulations dealing with the relation of planters and laborers are given in full and constitute interesting reading. The contract, if verbal, is assumed to be for a month only. Longer agreements must be in writing and acknowledged before a magistrate. The laborer may be employed during the hours usual to his occupation and when sent on a journey may not be required to walk more than twenty-five miles a day or carry a load of more than forty pounds. Most people will agree that further exaction on the part of the employer would seem a trifle oppressive.

In case of the sale of the estate to another person the contract is binding on the new owner, but the laborer may quit, on giving due notice. Refusal to work, on the part of the laborer, or to pay wages promptly, on the part of the employer, are alike punishable by imprisonment, as is also the enticing of servants from one employer by another. During temporary illness laborers receive food and medical care at the expense of the employer, who, however, is not bound to pay wages during such illness. Laborers' wages are a first charge upon estates. These wages seem generally to be 144 rupees, or about \$46 a year.

In addition to tea and rubber, there are complete chapters or comprehensive articles on cocoanuts, cocoa, cardamons, tobacco, sugar, jute, manila, hemp, sisal, ramie, san, hemp, bowstring hemp and silk cotton. The rubber section runs through 59 pages and includes estimates of opening and maintaining plantations; tables of cost and probable production during a series of years; distances and numbers of trees in plantations and plants in nurseries. The information about rubber seeds as a by-product is full of interest. The kernels amount to about 50 per cent. of total weight and these kernels yield 42 per cent. of oil similar to linseed oil, the residue furnishing a meal valuable as cattle feed. The seeds are collected by children at a price of a little over one cent a thousand, American money, and pay a moderate profit when shipped to Europe.

Methods of tapping, of coagulation, of packing and many other matters are discussed by experts in the light of the most recent experience. The regulations to prevent rubber theft read curiously like the extra-legal edicts of the Ku Klux Klan soon after the war, to stop the brisk midnight mer-

chandizing of cotton, which had become a business custom in many localities of the South. The penalties, however, are not the same.

HENDRICKS' COMMERCIAL REGISTER OF THE UNITED STATES for Buyers and Sellers. New York, 1914. S. E. Hendricks Co. [Cloth, quarto, 1,596 pages. Price 10 dollars.]

ABSOLUTE accuracy in classification is the chief merit of any directory; but to accomplish this object requires an immense amount of research and verification. This is particularly the case in a work intended to be used for constant reference, in which every name has to be checked over to insure correctness.

All these points have been kept in view in the compilation of the twenty-third annual edition of the above work, which has just been issued, and is well up to the mark of its predecessors. In fact, it includes many new features; it gives the names and addresses of the manufacturers of machinery and appliances required in the treatment of crude materials, including rubber, in appropriate classifications and sub-classifications. The descriptions of the various products are sufficiently detailed to give the prospective buyer just the information he is looking for. The principal houses in the rubber industry are also listed.

Numbering about 350,000 names in upwards of 45,000 business classifications, it will be readily understood why the index alone takes up 138 pages. The work, in its current issue, has fully maintained its reputation for accuracy and completeness.

THE FIRST OF THE 1915 CALENDARS.

The R. J. Caldwell Co., of 15 Park Row, New York, has stolen a march on all its rivals and been the first to issue a calendar for the year 1915. This company, which deals in tire fabrics—Sea Island, Egyptian and Peeler—handles the products of the Connecticut Mills Co., Inc., of Danielson, Connecticut, and the Canadian Connecticut Cotton Mills Co., Ltd., of Sherbrooke, Quebec, which have a combined capacity of 8,000,000 pounds; therefore it is quite appropriate that the 33 x 16 inch panel to which the calendar section is attached should contain reproductions of photographs of these two mills, while Old Father Time is pictured as "Still Going Strong," employing tires constructed of the fabrics of these mills to lend speed to his progress.

A NEW MILLER BOOKLET.

An interesting catalogue of information on accessories and illustrated description of repair materials has been published by the Miller Rubber Company, of Akron, under the title, "Modern Accessories for Permanent Tire Repairs." This attractive booklet covers all articles used in connection with the care and repair of tires. Illustrations and descriptive matter are clear and concise, and the booklet should afford valuable assistance in the selection and application of the right materials for any phase of tire repairing.

THE AMERICAN RUBBER CO.'S HANDSOME BOOK.

The American Rubber Co., of Boston, whose big factory in Cambridgeport, just across the Charles river from Boston, is a very conspicuous feature of the local landscape, has just issued a particularly well printed and handsome book of interior views showing the administrative offices and the various departments of the factory devoted to the manufacture of rubber garments. There are over twenty of these interior views (not to mention a few exteriors). They show the crude rubber, the sheets in the drying room, the rubber going through the calendars, the spreading and cutting rooms, the big workshops where the stitching is done, and finally, the garments hanging on racks in the vulcanizing rooms. This factory, by the way, has a capacity of over 3,000 garments a day.

SOME INTERESTING LETTERS FROM OUR READERS.

TO the Editor of THE INDIA RUBBER WORLD—Dear Sir: I would appreciate an opportunity of replying to your criticism appearing in the last issue of THE INDIA RUBBER WORLD, under the title "Mr. Cowen and the Marks process." This criticism is directed at remarks I made recently in England, in referring to the Alkali Process for reclaiming waste rubber. No one actively engaged in the rubber industry, at the present time, appreciates any more than I do the value to the industry of your vast and extended experience and the many acquaintances you have enjoyed with its most prominent men. There is no doubt but that we may list Mr. Robert Cowen as one of the foremost of these and one who did a great deal for the development of the rubber industry. I quite agree with you that Mr. Cowen was not a chemist, but he was indeed an expert machinist and an inventor. However, might we not say the same of Edison or of Goodyear? The former's inventions cover a wide range of the sciences, including chemistry, yet he could hardly be considered a chemist. The same is true of Goodyear, whose early training in the hardware business may have been of some assistance to him from a mechanical point of view, but had he known that *aqua fortis* contained sulphur he would no doubt have been able to take quicker advantage of the phenomena he observed in his experiments and detect the real relation existing between his tests and those of the unscientific Heywood, who had been using powdered sulphur. It is not at all uncommon to find that inventors seldom derive direct benefit or have a knowledge of the state of the science existing at their time. Mr. Cowen made up for this lack, in part, by employing young college graduates to work out his many ideas. Arthur H. Marks was one of these.

The statements I made, however, were not based upon hearsay. You must be aware that several patent suits have been brought to uphold the validity of the Marks patent, and some of these, I believe, are still pending. Without any desire, at the present, to go into the merits of these various cases, I would call to your attention letters which have been introduced in evidence and I think you will agree they sustain my statements.

In a letter from Mr. Cowen as Technical Manager of the Boston Woven Hose & Rubber Co. to Mr. Raymond B. Price, under date of October 25, 1900, he says:

"Since *he* went away from us I understand that he has taken out a patent for devulcanizing rubber by the use of high pressure and caustic soda. You well know that during the time that he was with us he was carrying out experiments of this nature. Of course it is well known to everyone who was connected with our company at that time that *he* was merely a workman in the laboratory carrying on this work under *your* direction—which work was directed mainly from suggestions received from *myself* as your superior officer at that time."

The word "*he*" refers to Mr. Arthur Marks, and the italics are mine.

Later Mr. Raymond B. Price, in writing to Mr. Robert Cowen as Technical Manager of the Boston Woven Hose & Rubber Co., under date of September 16, 1901, says:

"Your own letter files will show that the idea of carrying on the process on a larger scale was followed right up to the time of the company's failure." (1898) (Marks patent granted 1899)

The process referred to is the Alkali Process, and the "company" is the Boston Woven Hose & Rubber Co.

The following is an extract from a letter by Mr. Robert Cowen as Technical Manager of the Boston Woven Hose & Rubber Co. to Mr. Raymond B. Price, under date of December 14, 1899:

"Caustic soda is a solvent of sulphur, as has long been known, and is used extensively for a great many years. In fact, the National Rubber Co. used caustic soda for devulcanizing a great many years ago."

"Now I am anxious to develop this process and if there is anything that you can tell me that has been done in the past which belongs to the company, I shall be grateful to you for same, as it will save me from doing over what has already been done."

Another extract of interest in this discussion is the following, taken from a letter of Mr. Raymond B. Price to Mr. Robert Cowen, dated December 23, 1899. "Arthur" refers to Mr. Marks:

"As for the soda process, Arthur has no more right to a patent on that than has Ship Sweet, who first tried soda in the laboratory, or you, whose general ideas were carried out, or myself."

In view of the facts disclosed by the above letters is it conceivable that Mr. Cowen was, as you say, "wholly in favor of the acid process for reclaiming," or that were Mr. Cowen alive "he would, in his frank way, give Mr. Marks full credit for his process?"

Yours respectfully,

L. J. PLUMB, Chief Chemist,

October 19, 1914.

U. S. Rubber Reclaiming Co., Inc.

[The statement that Mr. Cowen did not claim the alkali process seems to be disproved by Mr. Plumb's very interesting communication. It is well to remember, however, that Mr. Cowen—and this is not meant to be derogatory—was an enthusiastic claimer and an honest one. He, for example, claimed to have started THE INDIA RUBBER WORLD. Possibly he did suggest a rubber trade publication to the writer. At all events the claim did no harm. He and others who generally stated that they, through suggestion, were its real founders, were never contradicted. The Editor.]

TO the Editor of THE INDIA RUBBER WORLD—DEAR SIR: The very interesting paper on "The Influence of Nitrogen Compounds on Rubber" which appeared in the September issue, has, I find, attracted considerable attention. The interest which has recently been shown in this subject prompts me to direct attention to several materials well known to chemists, but seldom if ever used by the smaller rubber-goods manufacturer who does not employ the services of an advisory chemist. There are several nitrogen compounds which come into consideration for rubber mixings because of their market price (about 10c. per pound in July, 1914). Among these may be mentioned casein, glue from tanneries and packing houses, fish glue and blood albumen. Several of these were recommended by me for use either alone or in combination, as early as the year 1910. At that time, however, rubber-goods manufacturers were loth to listen to such a "theory," in spite of the fact that German manufacturers were then actually making use of it. A younger chemist with some experience in rubber, assured me that "all such fancy additions to the compound have a bad effect on the rubber goods."

Other nitrogenous materials which might prove of value are powdered wood, which contains both nitrogen and sulphur; and powdered silk, which contains nitrogen. These materials in powdered form are both articles of commerce. One of the difficulties which might interfere with the use of such substances is their fibrous character and their moisture content. When precipitated gelatin is used in rubber compounds it should be previously mixed with glycerin or other softener.

Tetramino carbazol is an interesting aromatic amine obtained from coal-tar, and possibly this will prove of value as an accelerating agent in rubber mixings.

FREDERIC DANNERTH,

The Rubber Trade Laboratory, Newark, N. J.

Replete with information for rubber manufacturers.—Mr. Pearson's "Crude Rubber and Compounding Ingredients."

The Electrical Exposition and Motor Show of 1914.

THE Electrical Exposition and Motor Show of 1914 was held in the Grand Central Palace, New York, from October 7 to 17. In the extent and variety of exhibits and in the popular interest manifested it was the most successful show of this sort yet held. The attendance during the ten days ran close to the 200,000 mark.

While on the surface rubber was not greatly in evidence, it was, nevertheless, a very important feature of the exhibition. In fact, practically every exhibit there depended upon wires and cable insulated by rubber or gutta percha for its effective operation. Rubber-covered conductors made it possible to contribute the brilliant illumination which was an effective feature of the evening exhibit and to impart power to the great variety of machinery displayed. So, while rubber might not be called a conspicuous feature of the exhibition, there was much of it there if one but looked for it.

In the starting, lighting and ignition system of gasoline cars. Hard rubber enters into the construction of these batteries to a considerable extent. The battery jars, covers, vent-cap and the separator plates are all made of hard rubber, while soft rubber gaskets are used under the covers. One type of storage battery attempts to eliminate the use of hard rubber, but it is not wholly successful, as hard rubber insulation is still necessarily used on the bottom and sides of the jar and hard rubber strips are placed between the plates.

Pneumatic cleaners with rubber gaskets, rubber lined and armored hose and rubber-proofed dust bags were shown in great variety. The electrical washing machine that is guaranteed to save time and labor depends on the electrically operated wringer with its rubber-covered rollers to make it complete.

If you own a piano player and wish to avoid the exertion of pedaling there is a blower operated by electricity which will do



GRAND CENTRAL PALACE DURING THE ELECTRICAL EXPOSITION

For instance, there was an interesting apparatus exhibited by the Electrical Testing Laboratories for testing rubber gloves used by electrical workers. It subjects the gloves to a test of from 3,000 to 10,000 volts from one to five minutes. Unless they successfully withstand this test they are rejected as unfit for use.

There were various electric storage batteries which are used for operating autos, trucks and submarines. One type is used

for the starting, lighting and ignition system of gasoline cars. Hard rubber enters into the construction of these batteries to a considerable extent. The battery jars, covers, vent-cap and the separator plates are all made of hard rubber, while soft rubber gaskets are used under the covers. One type of storage battery attempts to eliminate the use of hard rubber, but it is not wholly successful, as hard rubber insulation is still necessarily used on the bottom and sides of the jar and hard rubber strips are placed between the plates.

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ignition batteries can be charged from an ordinary alternating current lighting circuit. Another device of interest to automobilists was the tungsten contact for igniting. There was also shown a complete line of the Mazda lamps and fixtures for motion picture theatres, department stores, factories and street lighters. The motor exhibit consisted of motors from one two-hundredth of a horsepower to ten horsepower. House owners were interested in the bell ringing transformers, gong type transformers, toy transformers and the household ozonator.

The Westinghouse Electric & Manufacturing Co. had an elaborate display of electrical apparatus both for home and industrial use. The exhibit included a complete line of motors, heating apparatus, measuring instruments, protective devices and apparatus used in the generation and distribution of electric power. A striking feature was the new Luxsolite fixture showing the "Type C" Mazda lamp arranged for street lighting. The radiant toaster, an inexpensive device for making crisp toast, was one of the interesting culinary features of the exhibit. The Venturia and Sirocco types of ventilating outfits for homes and buildings were shown. A complete line of alternating and direct current motors for industrial, home and farm use, together with accessories used with each, attracted considerable attention. There was the pillar type flame arc lamp which is being extensively used in the illumination of the "White Ways" of cities and towns. This is an ornamental type of lamp which is very attractive.

In the division of Electro-Therapeutics there was a great variety of machines and apparatus in which both hard and soft rubber were in evidence. The comprehensive exhibit by the New York Edison Co. consisted of electrical appliances for the hospital, the general practitioner, for dental offices and the electrical insulation of a modern operating room. An X-ray outfit in which rubber plays an important part was a feature of this exhibit.

The Oxyoline apparatus used in the treatment of tuberculosis and which is attracting much attention among physicians, has considerable hard rubber and soft rubber tubing. There were machines for the treatment of high blood pressure, reducing machines, line irrigating equipments and various types of lamps for dermatological work—all of which use rubber in some form.

The Turner Detective Dictograph with hard rubber ear pieces, cover and keys and the "Acousticon," which is all hard rubber, are instruments of extreme interest, respectively, to the wrong-doer and the deaf.

The War Department of the United States Government exhibited field signalling apparatus and methods. Here insulated wire was in evidence. The Navy exhibit showing the navigating appliances, steering devices and signal system used on a modern battleship did not lack in rubber of some sort. In the control of a modern gun turret or gun fire control, in coast defence or artillery practice, the telephone plays an important part. The double head sets are provided with soft rubber ear pieces for protection. A modern rubber diving suit and a diver's lamp with its rubber gasket are part of every battleship equipment.

In the modern dairy the electric motor and india rubber have taken the place of the dairymaid. The cows are milked by means of an electrically driven vacuum pump, rubber teat cups and rubber tubing. There was in this exhibit a mechanical filling machine which with the aid of a soft rubber disc fills and caps the bottles of milk and cream.

In the model garage and charging station could be seen the various types of the Schaler Vul-Kit, Model B, Motorist Model and Garage Model Vulcanizers. These are electrically operated and guaranteed to satisfactorily repair any type of tire or inner tube.

EXHIBITION NOTES.

The Habirshaw Wire Co., Yonkers, New York, exhibited submarine cables used for mines and torpedoes, signal wires and cables used in electrical transmission as well as aerial automobile

cable. The features of the exhibit were the "Black Core," "New Code" and "Red Core" wires.

The General Vehicle Co. exhibited delivery vehicles. The solid tires used were the Firestone Removable and the United States Demountable.

The Ward Motor Vehicle Co. exhibited a small electric delivery wagon designed to meet the requirements of local tradesmen. The tires were Firestone Side Wire Quick Demountable S. A. E. The truck exhibited by this company use the Dual Firestone Side Wire Q. D. tires on both front and rear wheels.

The Detroit Electric Vehicle Co. exhibited three cars with Motz and Goodrich Silvertown Cord Tires. The control handles of the cars, switch and push keys were of hard rubber.

The Rauch & Lang Co. exhibited two limousines with Motz tires, rubber running board tread and hard rubber mountings on the doors and control handles.

The New York Edison Co. made an interesting exhibit of the method used in splicing electrical cables. There was a demonstration of the application of electricity in the manufacture of so-called artificial ice and refrigeration for the production of iceless ice cream.

Among the many "Safety First" devices for industrial plants was the Push Button Control exhibited by the General Electric Co. This is a simple, practical device for starting, stopping and controlling the speed of motors simply by pushing a button.

RUBBER CARGOES SUNK BY THE BELLIGERENTS.

The German cruiser "Emden" is reported to have sunk 15 or 16 merchantmen in the Indian Ocean. Among them was the "Troilus" which had, among other items of cargo, 1,200 tons of rubber. Another English steamer, the "Titan," is reported to have been set on fire at Port Said. Its cargo of rubber is estimated at somewhere from 300 to 500 tons. The British steamer "Indian Prince," which was sunk by the converted German cruiser "Kronprinz Wilhelm" September 9 off the Argentine coast, was on its way from Bahia to New York with a cargo of coffee and a shipment of 17 tons of Maniçoba rubber.

THE WAR MAKES HIGH INSURANCE RATES.

Rubber importers are feeling the effects of the war in excessive insurance rates. Inquiries on rates from Pará to New York are met with figures of from 1½ to 2 per cent., but on taking out the papers for an actual shipment, the rate is usually from 3 to 4 per cent., showing the uncertainties of trade during war time.

TRADE CONDITIONS AS SEEN BY RUBBER CLUB MEMBERS.

Early in October the Rubber Club of America sent out a series of questions to prominent rubber manufacturers throughout the United States to get their ideas on the business outlook. Nearly all of the letters were answered promptly and in detail and the replies were singularly unanimous.

From a careful comparison of the answers, one could be able at once to see that the rubber trade was in a fairly satisfactory condition. In the matter of collections, wholesale and retail, there has been a slight slowing up. The number of unemployed seems to be about the same as last year. Supplies of raw products during the last month have been normal, although deliveries during the early days of hostilities were slow and prices were raised for a time. Of manufactured rubber goods imported, a great many lines have been cut off entirely, but none that could not be produced in the United States. Manufacturers are looking with interest to outside markets and making some effort to secure them, but are cautious because of lack of credit facilities. The behavior of banks towards borrowers seems to be about normal.

News of the American Rubber Trade.

ANNUAL MEETING OF THE MCGRAW TIRE & RUBBER CO.

AT the annual meeting of The McGraw Tire & Rubber Co., held at the company's offices at East Palestine, Ohio, on October 1, a very satisfactory year's business was reported. The following officers were elected for the year: President, E. C. McGraw; vice-presidents, R. W. McGraw and John Morgan; secretary, L. M. Kyes; treasurer, John Morgan.

A conference of the branch managers and sales force of the McGraw company was held during the week commencing October 5, when plans were laid for an extensive distribution of product for the coming year. The company reports an exceptionally bright outlook.

BOSTON WOVEN HOSE & RUBBER CO.

At the annual meeting of the Boston Woven Hose & Rubber Co., held early in October, the board of directors was re-elected for the ensuing year, and it was voted to change the by-laws to permit the election of more than one vice president. This company is experiencing no difficulty in obtaining all necessary supplies of crude rubber at satisfactory prices, and reports that while its European business has been unfavorably affected by the war, trade in general is holding up fairly well, and the directors are optimistic as to rubber trade conditions.

WESTINGHOUSE AIR BRAKE CO.'S ANNUAL REPORT.

The consolidated statements of the Westinghouse Air Brake Co. covering the fiscal year ending July 31 show net earnings for the year of \$3,482,993, a decrease of \$2,581,784 from the earnings of the preceding fiscal year. The annual inventory totals \$5,625,023, against the July, 1913, inventory of \$4,307,505, while the cash on hand is given as \$2,479,095, and accounts and bills receivable as \$3,132,723 against similar items for the previous year of \$4,050,495 and \$4,865,762. The statement shows a surplus of \$5,648,495, which is \$145,807 in excess of that shown on August 1, 1913.

MAGNETIC CLUTCHES FOR NATIONAL INDIA RUBBER CO.

The Cutler-Hammer Clutch Co., of Milwaukee, Wisconsin, has just closed a contract with the National India Rubber Co., of Bristol, Rhode Island, through Messrs. Lockwood, Green & Co., consulting engineers, Boston, for two 72-inch H-60 magnetic clutches and one 72-inch H-75 clutch. The 72-inch H-60 clutches will be used on shafts where they will be called upon to transmit 600 H. P. at 60 R. P. M., while the 72-inch H-75 clutch will be employed for the transmission of 400 H. P. at 36 R. P. M.

These clutches are being installed for the protection of workmen engaged in and about the mill, and were selected after a careful investigation of the merits of the various types of mechanical clutch, as well as the features of the Cutler-Hammer product.

RUBBER COMPANY DIVIDENDS.

The Hood Rubber Co. has declared the twenty-seventh consecutive quarterly dividend of $1\frac{3}{4}$ per cent. on its preferred stock—payable November 2 to stockholders of record on October 28.

The Swinehart Tire & Rubber Co., of Akron, has declared a dividend of 6 per cent. for the coming year—payable quarterly.

The United States Rubber Co. paid on October 31 quarterly dividends of 2 per cent. on first preferred, $1\frac{1}{2}$ per cent. on second preferred and $1\frac{1}{2}$ per cent. on common stock of the company, to stockholders of record on October 15.

The Electric Hose & Rubber Co., of Wilmington, Delaware, at its annual meeting held October 20, declared a regular dividend of 3 per cent. and an extra dividend of 1 per cent. for the six months ending September 30, making a total dividend paid for the year of 8 per cent.

CHANGES IN CAPITAL STOCK.

The capital stock of the Continental Rubber Works, of Erie, Pennsylvania, has been increased \$1,000,000.

The Racine Rubber Co., of Racine, Wisconsin, has increased its capital stock from \$1,000,000 to \$1,500,000, divided into 5,000 shares of preferred and 10,000 shares common, each with a par value of \$100 per share.

The East Palestine Rubber Co., of East Palestine, Ohio, has increased its capital stock from \$150,000 to \$500,000.

CHANGES IN THE UNITED STATES TIRE CO. FORCES.

O. S. Tweedy, who ever since the formation of the United States Tire Co. has been its Eastern District manager, has been promoted to the position of assistant general sales manager. Mr. Tweedy will continue to supervise the Eastern territory and will also look after the trade of the Central District. He is a thoroughly experienced tire man, having been associated for ten years with the Diamond Rubber Co., for two years with the Federal Rubber Manufacturing Co., as general sales manager, and also with the Continental Caoutchouc Co., as New York sales manager.

Thomas Burton, who has been assistant manager of the Eastern District, has been transferred to Atlanta, Georgia, succeeding T. B. Goodloe, who will join the New York sales force.

George S. Shugart, of the Central District, with headquarters at Chicago, has been given the title of District Manager.

O. S. Johnson, formerly manager of the Buffalo branch, has been transferred to Houston, Texas, to succeed W. F. Gordon as Texas State manager, Mr. Gordon having resigned his position with the company to open an automobile agency at Dallas.

A NEW HARD RUBBER COMPANY.

The India Rubber Co. has just begun the manufacture of hard rubber goods in a newly equipped plant in New Brunswick, New Jersey. It will manufacture hard rubber battery jars—having a capacity of 500 jars per hour—and also caps and barrels for fountain pens and other hollow molded and turned hard rubber material. The plant is in charge of Mr. H. Weida, who has had fifteen years' experience in hard rubber manufacture. For ten years of that time—up to the first of April last—he was manager of the hard rubber department of the Diamond Rubber Co., and had previously been connected with the American Hard Rubber Co. and the Peoples Hard Rubber Co.

CONNECTICUT TIRE FABRIC MILLS BUSY.

The Connecticut manufacturers of tire fabrics are rushed with orders. The Manhasset Manufacturing Co., at Putnam, is running night and day on orders, while the Killingly Manufacturing Co., at Williamsville—a subsidiary of the Goodyear Tire & Rubber Co., of Akron—has found it necessary to increase its equipment and capacity, to meet the demands of the Goodyear company, which takes its entire output. The \$50,000 worth of new machinery recently purchased for this plant is being installed and by the first of January it is expected that it will have a producing capacity of 1,500,000 yards of tire fabric a year.

AMERICAN COTTON GOODS FOR EUROPE.

It is reported that some two million yards of cotton duck have recently been sold to Europe for army orders; the trade having been practically all done through a few houses on this side with European representatives. Inquiries have reached here for further large quantities, but in a more or less indefinite shape. English demands have largely been for cotton goods to a certain specification.

THOMAS ALEXANDER FORSYTH.

THOMAS ALEXANDER FORSYTH, president of the Boston Belting Co., was born in Brookline, Massachusetts, April 12, 1852. He is the fourth son of William Forsyth, who came to this country in the early part of last century, from his home in Ayrshire, Scotland.

The family is an ancient one, tracing its ancestry back to Cadet de Forsath, a member in the train of Eleanor, daughter of Raymonde, Comte de Provence, when she went to England in 1236 and married Henry III, King of England. The son, William de Forsath, in 1296, according to the records, took the oath of fealty to King Edward I, of England, who at that time was at war with Philip IV, of France. A straight, unbroken line from these ancestors is on record.

William Forsyth, son of Captain John Forsyth, of the British army, came to Boston in 1828, moved to Brookline and later to Roxbury, to be near the factory of the Boston Belting Co., in which he was a foreman. The family consisted of five sons and three daughters, and as the sons left school they were employed in that factory.

Thomas A. Forsyth, though born in Brookline, was educated in the public schools in Roxbury, which is now a portion of Boston. At the age of fourteen he went into the factory of the Boston Belting Co. and, beginning at the bottom, became successively an experienced workman, foreman, assistant superintendent and superintendent; and on the death of his brother he became president of the company. Knowing the entire details of the business from the receipt of the raw materials to the shipment of the finished product, he is especially fitted for the position, as the steady, continued success of the company and its increasing business fully prove.

Being, like all his family, mechanically ingenious, he, with his brother James, worked out many problems of manufacture and made several important improvements in the machinery of the factory, also solving some intricate problems in the manipulation of rubber and the details of manufacturing the goods for which the company is noted. For several of these improvements he has secured patents.

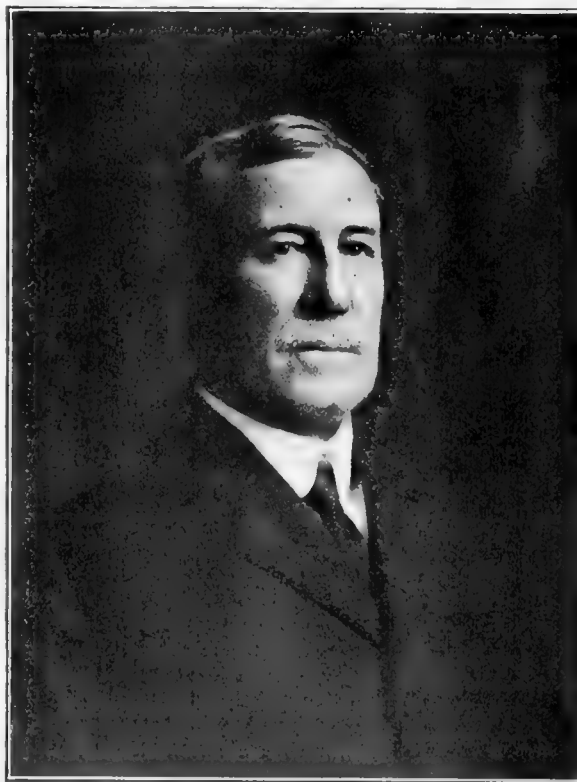
Two of Mr. Forsyth's traits are worthy of mention, namely, his desire for perpetuating the memory of his family, and his broad philanthropy. Mention has been made in this journal of the beautiful window in memory of the family in a prominent church in Roxbury, and of the baptismal font and rose window dedicated to his sister Margaret; but his great philanthropy, one which has no duplicate in the world, is the gift to the city by the late John Hamilton Forsyth and Thomas A. Forsyth of the Forsyth Dental Infirmary for Children, founded in memory of their brothers, James Bennett and George Henry Forsyth. This magnificent building, which will be opened this month, is one of the most beautiful of all the ornate structures in Boston's Fenway.

It is the outcome of a report of a systematic examination

of the children in Boston's public schools, conducted by the late Dr. Gallivan. Of the 118,000 pupils examined over 51,000 were found to have defective teeth, while other defects originating in the mouth brought the total up to 84 per cent. of all defects found.

Andrew Carnegie was asked to found an institution where such defects could be alleviated and cured, or by timely treatment wholly prevented. He was more interested in libraries than infirmaries, and declined, so the opportunity came to this Scotch-American family to found, build and endow a charity which will be—in fact, already is—world famous.

Mr. Forsyth is greatly interested in art, being a member of the Art Museum and the Boston Art Club. He is vice-president of the Forest Hills Cemetery Corporation, and is on the Board of Overseers of the Poor of the City of Boston. He makes his home at one of Boston's leading hotels. A spacious room has been set apart on the first floor of the infirmary named "The Founders' Room," which will not only contain memorials of the Forsyth family, but will also house his extensive library and works of art. Here doubtless he will spend many of the hours which he may find himself able to spare from his office in the factory in Roxbury.



THOMAS A. FORSYTH.

PERSONAL MENTION.

Henry Spadone, president of the Gutta Percha & Rubber Manufacturing Co., of New York, has been elected a director of the Importers' & Traders' National Bank of that city.

James C. Brady, a director in the United States Rubber Co., and son of the late Anthony N. Brady, was married on October 14, to Lady Victoria May Pery, daughter of the Earl and Countess of Limerick, of Dromore Castle, Limerick, Ireland. The wedding took place at the home of Mr. Brady's brother,

Nicholas F. Brady, at "Sea Verge," Monmouth Beach, New Jersey. Mr. and Mrs. Brady are now at the New Greenbrier Hotel, White Sulphur Springs, West Virginia, where they will remain for several weeks.

J. W. Whitehead, for the past eight years assistant sales manager of the California branch of the Diamond Rubber Co., has resigned that position to assume charge of the Pacific Coast business of the Norwalk Tire & Rubber Co., of Norwalk, Connecticut.

Fred Harrington, formerly connected with the Firestone Tire & Rubber Co.'s branch at Philadelphia, has been promoted to the management of the Detroit agency.

A. I. Butler, formerly manager of the Brooklyn branch of the Goodyear Tire & Rubber Co., is now special representative in northern New York territory for the Batavia Rubber Co., of Batavia, New York.

H. M. Applegate, formerly advertising manager for the Lee Tire & Rubber Co., of Conshohocken, Pennsylvania, has become associated, in a similar capacity, with the Rutherford Rubber Co., of Rutherford, New Jersey.

COL. COLT CONDEMNNS UNNECESSARY HOARDING.

President Samuel P. Colt, in commenting upon the action of the board of directors of the United States Rubber Co. in declaring the regular quarterly dividends upon the preferred and common stocks of the company early in October, said:

"The dividends having been amply earned and the finances of the company being in easy condition—with \$8,000,000 of cash on hand—I think the action of the board not only conservative, but one that is entitled to commendation in these times of war and financial stress. The division of \$1,700,000 at this time among the 15,000 stockholders of the company will, I am satisfied, do much good and be most thankfully received."

President Colt also condemned the unnecessary hoarding of money by either banks or other corporations.

MR. FERREIRA VISITS NEW YORK

Mr. Adelino A. Ferreira, representing Leite & Co., Inc., a prominent rubber house of Pará, Brazil, made a two weeks' visit to New York during the latter half of October. The purpose of this visit was the promotion of trade facilities between Pará and New York through the establishment in the former city of New York bank representation, and negotiations tending toward such arrangements are understood to be now under way as a result of Mr. Ferreira's representations to prominent New York bankers.

PERSONAL MENTION.

Mr. A. Terry, of A. Terry & Co., 8 Haydon street, Minories, London, E. C., who was agent for large Austrian and German concerns in mechanical rubber goods, druggists' sundries and waterproofing, is looking for suitable American connections. He visited the United States the latter part of October and made two connections in other important lines and now desires to correspond with manufacturers in those named above.

Mr. Ernest E. Buckleton, president and general manager of the North Western Rubber Co., Ltd., is in the United States at the present time on a brief visit.

On October 16, Mr. S. George Mills completed twenty-two years of continuous service with C. J. Bailey & Co., prominent Boston rubber goods dealers. Mr. Mills has an exceedingly genial personality, and is one of the most successful retail rubber salesmen in the country.

TRADE NEWS NOTES.

Revised plans are being prepared for a factory and office building for the Santo Rubber Co. at Niagara Falls, New York, and bids will soon be taken. The cost of this building, the main section of which will be of brick construction, 82 x 250 feet in area, two stories high, has been estimated at \$100,000.

The Safety Signal Co. has been incorporated in New York, with an authorized capital of \$200,000, to manufacture devices for automobiles, rubber goods, etc. The Incorporators are Arthur W. Dennen, Stanley C. Fowler and Rebecca Hilliker.

THE GENERAL MANAGER OF THE THERMOID.

THE Stokes family of three and more generations back were iron men, first in England and later in the United States. Of them the most widely known was the late Joseph Stokes, who for years directed the destinies of the great New Jersey Steel & Iron Co. and its five thousand men. Today the descendants of the "iron master" are rubber men, and it is one of them who is the subject of this sketch.

Mr. Robert J. Stokes, manager of the Thermoid Rubber Co., grandson of Joseph Stokes and son of William J. B. Stokes, was born in Trenton, New Jersey, thirty one years ago. After attending the State Model schools in his native city he entered Princeton College, graduating with honors in 1904. With a decided taste for mechanics, a good knowledge of chemistry and possessing in a marked degree the family trait of organization, it was natural that he should turn toward rubber manufacture. He therefore entered the Thermoid factory, learned the business from the ground up, became foreman, superintendent and general manager. In 1908 he married the daughter of the late Judge Jonathan Dixon, of Jersey City.

Mr. Stokes is a genial, athletic, popular, six footer, enthusiastic in his work and, in addition, is more than excellent in such sports as tennis and golf.



ROBERT J. STOKES.

THE RUBBER TRADE ASSOCIATION OF NEW YORK.

In the September issue of this publication mention was made of the preliminary steps which had been taken by rubber importers in New York toward effecting an organization for their mutual benefit. The first meeting was held on August 12, with a second meeting two days later at which a committee was appointed to outline a plan for the proposed association.

This committee having drawn up a constitution and by-laws, a meeting was called on October 23 at 80 Maiden Lane, New York, and the association was definitely organized, under the name of the Rubber Trade Association of New York. A constitution and by-laws were adopted; initiation fees and dues were placed at \$25 each, and the following officers, directors and committee members were elected:

OFFICERS.—Wm. E. Bruyn, president; Ed. Maurer, vice-president; Wm. H. Stiles, treasurer; Ed. Weber, secretary. DIRECTORS.—H. A. Astlett, Chas. T. Wilson and Ed. Weber, three years each; R. W. Earle, F. R. Henderson, Ed. Maurer and Wm. H. Stiles, two years each; F. G. Gove, Wm. T. Baird, W. G. Ryckman and Wm. E. Bruyn, one year each.

MEMBERSHIP COMMITTEE.—Chas. T. Wilson (chairman), Wm. T. Baird, Wm. H. Stiles, R. W. Earle, A. B. MacNamara, G. Singleton, R. L. Chipman. ARBITRATION COMMITTEE.—Ed. Maurer (chairman), F. R. Henderson, Fred'k G. Gove, Wm. H. Stiles, Chas. T. Wilson.

CONTRACT COMMITTEE.—Wm. T. Baird (chairman), Wm. E. Bruyn, Ed. Maurer, Wm. H. Stiles, E. Korn, Chas. T. Wilson. HOUSE COMMITTEE.—F. R. Henderson, Chas. T. Wilson.

NEW INCORPORATIONS.

B & K Specialty Manufacturing Co., October 9, 1914; under the laws of New Jersey; authorized capital, \$50,000. Incorporators: Lester W. King and U. Grant King—both of 1101 Greenwood avenue—and Solomon Berman, 153 South Broad street—all in Trenton, N. J. To buy, sell, export, manufacture and assemble rubber goods, electrical goods, and all goods of which rubber is a component part.

Boska Manufacturing Co., Inc., October 14, 1914; under the laws of New York; authorized capital, \$100,000. Incorporators: Chas. F. Saunders, 164 Sherman avenue, R. W. Wason, 607 West One Hundred and Thirty-ninth street—both in New York, N. Y., and Simon F. Peavey, Jr., 151 Columbia Heights, Brooklyn, N. Y. To manufacture rubber tires and tire fillers.

DeSilva Rubber Co., Inc., The, October 19, 1914; under the laws of New York; authorized capital, \$10,000. Incorporators: A. Martin DeSilva, 210 West One Hundred and Ninth street, Harry E. Fry, 886 Third avenue, and Edward Wagner, 349 East Fifty-second street—all in New York, N. Y. To manufacture rubber goods of all kinds, in particular, rubber heels.

Eastern Rubber Co., October 6, 1914; under the laws of Massachusetts; authorized capital, \$90,000. Incorporators: Christopher Brien, 37 Larned street, West Detroit, Mich.; Fred C. Miskelly, 217 Proctor avenue, Revere, and Jane A. Hay, 381 Talbot avenue, Dorchester—both in Massachusetts. To manufacture and deal in rubber goods, coats and garments, boots, shoes, rubbers and all kinds of leather, rubber and cloth goods and novelties.

Goodyear Tire & Rubber Co., Inc., The, October 14, 1914; under the laws of New York; authorized capital, \$1,000. Incorporators: James W. Hobbs, 1972 Broadway, George Norris and Francis K. Raynor—both of 115 Broadway—all in New York, N. Y. To represent the Ohio corporation of similar name in Eastern United States, and to deal in its products.

Greenville Fisk Tire Co., The, September 21, 1914; under the laws of South Carolina; authorized capital, \$5,000. Incorporators: T. H. Cunningham and M. C. Westervelt. To deal in automobile tires and accessories.

Johnson Pneu-Metal Tire Co., October 2, 1914; under the laws of Massachusetts; authorized capital, \$1,000,000. Incorporators: Fred I. Johnson, Prospect street, Fitchburg; James H. Duffy, 18 Tremont street, and William P. Meehan—both of Boston—all in Massachusetts. To deal in tires.

Neptune Packing & Rubber Co., Inc., October 16, 1914; under the laws of New York; authorized capital, \$5,000. Incorporators: Katherine V. Du Bois and James F. Du Bois—both of 31 Third avenue, New Brighton—and Frank X. Feury, 16 Haven Esplanade, Tompkinsville—all in New York, N. Y. To manufacture packing and rubber goods, and engineers' and machinists' supplies.

Reliable Tire & Rubber Co., September 25, 1914; under the laws of New Jersey; authorized capital, \$24,000. Incorporators: Albert Numbers, Erastus L. Irving and Arthur R. Colvin—all of Trenton, N. J. To manufacture, purchase, trade and deal in automobile tires, inner tubes and all other automobile accessories and other kinds of rubber.

Reliable Tire & Supply Co., Inc., October 5, 1914; under the laws of New York; authorized capital, \$5,000. Incorporators: Bluma Skoson and Estelle Skoson—both of 934 East One Hundred and Seventy-ninth street, and Louis H. Lex, 429 West Thirtieth street—all in New York, N. Y. To deal in all lines connected with the auto industry.

Safety Auto Tire & Tread Co., September 21, 1914; under the laws of New Jersey; authorized capital, \$50,000. Incorporators: Cornelius D. McGiegan, 2 Pearsall avenue, Jersey City, N. J.; Charles Vail, 29 Broadway, and George A. Honnacker, 309

Broadway—both of New York, N. Y. To sell and repair automobiles and to construct and repair and sell automobile rubber tires.

Safety Tire Co., Ltd., The, September 2, 1914; under the laws of Canada; authorized capital, \$1,000,000. Incorporators: Joseph Georges Frenette, Arthur Moisan, Achille Begin, Ernest Taschereau and Armand La Vergne—all of Quebec, Canada. To manufacture wheels, rims, tires, etc.

Small Co., F. O., September 30, 1914; under the laws of Massachusetts; authorized capital, \$25,000. Incorporators: Frank O. Small, 444 Southamptton street; Paul A. Peters, 53 Lincoln street; Walter Bates Farr, Nelson B. Todd and Edward N. Chase—all of 179 Lincoln street—all in Boston, Mass. To manufacture, buy and sell rubber, rubber substitutes and compounds, etc.

Standard Tire & Rubber Co., September 11, 1914; under the laws of South Carolina; authorized capital, \$5,000. Incorporators: J. D. Bridges (president and secretary) and S. E. Brown (treasurer). Principal place of business, Greenville, S. C. To buy and sell automobile supplies of every kind and description whatsoever, and bicycles.

Star Tire & Rubber Co., July 31, 1914; under the laws of Wisconsin; authorized capital, \$5,000. One of the incorporators being John W. Mart, 2104 East Mifflin street, Madison, Wis. To manufacture, sell and purchase tires.

Southwestern Rubber Co., September 14, 1914; under the laws of Texas; authorized capital, \$25,000. Incorporators: Niels Esperon, F. R. Reese and W. N. Grafius—all of Houston, Tex. To buy and sell goods, wares and merchandise of any description by wholesale, or by wholesale and retail.

Weinman Elastic Web Co., Inc., October 17, 1914; under the laws of New York; authorized capital, \$15,000. Incorporators: Isak Weinman, 80 Walker street; Leo Weinman, 50 Leonard street—both in New York, N. Y.—and Jos. Sherline, 156 Van Buren street, Brooklyn, N. Y. To manufacture elastic web, cloth and fabric, of which rubber is a component part.

Western Sales Corporation, October 19, 1914; under the laws of New York; authorized capital, \$15,000. Incorporators: Chas. H. Taylor, Thomas Catlin and Sherman A. Hooker—all of 1330 Marine Bank Building, Buffalo, N. Y. To manufacture and deal in tire fillers, auto accessories, etc.

Williams Tire & Rubber Co., September 30, 1914; under the laws of Pennsylvania; authorized capital, \$5,000. Incorporators: Joseph A. Stabler, Jr., Samuel R. Birch—both of Glassport—and Thomas Young, McKeesport—all in Pennsylvania. To manufacture pneumatic tires out of rubber and rubber products for automobiles, bicycles, etc., and the manufacture of other articles of rubber and rubber products.

THE KING RUBBER CO.

The King Rubber Co., of Hyde Park, Massachusetts, which commenced manufacturing in June last, is at present specializing in seamless rubber gloves, both household and surgical. Equipment is being secured, however, for the manufacture of transparent nipples, a line of which it is intended to produce to replace those formerly imported from Germany and Austria. The production of other seamless rubber goods will follow, including tobacco pouches, bathing caps, etc. The company reports excellent progress and an encouraging outlook. W. W. MacDonald, formerly technical expert with the Davidson Rubber Co., of Boston, is associated with this enterprise. M. D. Kingsbury, formerly purchasing agent for the Davidson company and for the Boston Woven Hose & Rubber Co., is in charge of the office; while J. A. Crowley, well known in the drug and sundry lines, is the company's sales representative in New York and vicinity.

GOOD RECORD FOR "VACUUM CUP" TIRES.

The test of Oilproof Vacuum Cup tires inaugurated last March has recently been completed and results in a fine record, the total distance recorded for the nine tires on trial being 60,772 miles, or an average of 6,752 miles for each tire. This test was made under the direction of the laboratory of the Automobile Club of America, official observers of the club accompanying the drivers of the cars on which the tires were used, and all the tires were purchased by the club, from different dealers in several eastern cities, so that only stock tires should be employed in the test. The average mileage for tires used on wire wheels was 5,470; on wood wheels 8,076.

The Pennsylvania Rubber Co., of Jeannette, Pennsylvania, which makes the Vacuum Cup tire, has brought suit against the Dreadnaught Tire & Rubber Co., of Baltimore, Maryland, in an effort to restrain the latter company from use of the terms "Vacuum Tread" and "Vacuum Cup Tread" in connection with its tire product.

THE UNION RUBBER & SUPPLY CO. TAKES LARGER QUARTERS.

The Union Rubber & Supply Co., of St. Louis, Missouri, announces its removal from 410 Market street to larger and more conveniently located quarters at 18 South Broadway, in the district known as the "White Way." This company, which has made continued progress since its establishment thirteen years ago, carries a complete line of mill supplies, including balata and leather belting; fire department equipment; automobile tires, and a full line of the Revere Rubber Co.'s rubber belting, air and water hose, valves and sheet and piston packings.

RECEIVER APPOINTED FOR OVERMAN TIRE CO.

A petition in bankruptcy has been filed against the Overman Tire Co., Inc., and a receiver appointed by the court, authorized, under a bond of \$5,000, to continue the carrying on of the business for a certain period. The company's liabilities are given as between \$60,000 and \$70,000, and the assets \$60,000. This company, located at 250 West Fifty-fourth street, and with salesrooms at 1855 Broadway, New York, was incorporated in February, 1913, under the laws of Delaware, with a capital stock of \$3,000,000.

THE NELSON SURF COASTER.

The cut below shows a new device for surf coasting introduced this season at Long Beach, California, and reported to have become quite popular at that resort. While designed primarily for sport and amusement, it may be used also as a safety device in case of cramps or accidents. This coaster



is made with rigid frame and air-tight compartment entirely covered with waterproof canvas. It varies in size from 2 to 7 feet in length and from 10 to 18 inches in width and weighs from 3½ to 9 pounds. [Nelson & Woods Manufacturing Co., Long Beach, California.]

TRADE NEWS NOTES.

The Peerless Tire & Rubber Co. has been incorporated at Louisville, Kentucky, to carry on a jobbing and distributing business in tires and tubes, rubber accessories and mechanical rubber goods. It is located at 624-6 South Third street, has a capitalization of \$15,000 and is controlled by men thoroughly acquainted with the rubber goods trade.

The New York branch of the Braender Rubber & Tire Co., of Rutherford, New Jersey, will soon remove from 1987 Broadway to larger quarters at 250 West Fifty-fourth street.

I. Novick & Co., manufacturers of coats and raincoats at 133 West Twenty-first street, New York, have filed schedules in bankruptcy showing liabilities of \$50,331, and assets amounting to \$13,100.

At the autumn festival held October 17 in connection with the Grill dances at the Plaza Hotel in New York, a toy balloon blowing contest was one of the special features of the evening's entertainment.

A method of effecting tire economy which can easily be followed by motorists generally has been adopted by an ingenious tire user. He places a worn-out casing over a good one, making slits across the outer casing about 4 inches apart, to give a non-skid effect.

A fourth story has been added to the brick and concrete warehouse on Schuylkill avenue, Philadelphia, owned by the Philadelphia Rubber Works Co. The cost of this addition is estimated at \$15,000.

The Williams I X L Tire & Rubber Co., a corporation capitalized at \$300,000, has purchased a site at Buena Vista, Pennsylvania, for a plant to manufacture automobile tires and other rubber goods.

The York Co-operative Tire & Rubber Co., of New Orleans, Louisiana, is said to be looking about for a suitable site for a factory for the manufacture of tires and a new tire fabric. Leslie Dunn, president of the company, recently visited Canton, Ohio, with this end in view, the proposed plan calling for the erection of a factory equipped to turn out 2,000 tires daily, and providing that only automobile owners shall be stockholders in the concern.

Insulated wire and cables to the value of \$127,697 were exported from the United States during July of the present year. Similar shipments for July, 1913, amounted to \$147,948.

The plant of the Patterson Rubber Co. at Lowell, Massachusetts, will be sold at public auction on October 31 as a result of foreclosure of the mortgage held by Francis H. Appleton, one of the organizers of and principal stockholders in the concern. This is a comparatively new plant, and it is believed that work will not be interrupted but that several of the present stockholders will unite in reorganizing the company.

A test of car and tire endurance was recently made by Henry J. Adams, of Fostoria, Ohio, on a 3,000-mile trip, which included all the principal cities from Cleveland to Montreal, thence to Boston, Baltimore, and across the Alleghany Mountains into West Virginia and back into Ohio. This trip was made in a Reo car equipped with tires made by the Miller Rubber Co., of Akron, Ohio. At the end of the trip Mr. Adams reported as follows: "The tour lasted twenty-five days, and the tires are good for another trip."

C. A. Dunham, for the past three years manager of the Pittsburgh branch of The B. F. Goodrich Co., has been promoted to the management of a larger branch at Cleveland, Ohio. Before leaving for this new field Mr. Dunham was presented with a diamond scarf pin by the employees of the Pittsburgh branch. The position vacated by his transfer will be filled by F. E. Titus, formerly located at Buffalo, New York.

MR. C. E. SIEGFRIED.

Mr. C. E. Siegfried, who, as stated in our October issue, has become the Akron representative of Charles E. Wood, the crude rubber broker of New York, has had quite an extended experience in the rubber industry. For eight years he was connected with the Goodyear Tire & Rubber Co., being for three years in charge of their molded goods sales department. He has also had charge of the same department in the Miller Rubber Co. He has traveled extensively in the West, where he is well acquainted with the rubber trade.



C. E. SIEGFRIED.

EXHIBITORS AT THE AUTOMOBILE SHOWS.

At the automobile shows to be held by the National Automobile Chamber of Commerce in New York and Chicago, under dates of January 2-9 and January 23-30, respectively, the following accessory manufacturers will have exhibits: Double Fabric Tire Co., Auburn, Indiana; Voorhees Rubber Manufacturing Co., Jersey City; A. Schrader's Son, Inc., Brooklyn; C. A. Shaler Co., Waupun, Wisconsin; F. S. Carr Co., Boston; Leather Tire Goods Co., Niagara Falls, and the Pantasote Co., New York.

TRADE NEWS NOTES.

W. T. Kyle has joined the sales force of The Okonite Co. at the company's general office, 253 Broadway, New York City. Mr. Kyle has been for the past six years connected with the Duplex Metals Co., as district sales manager.

A voluntary petition in bankruptcy was filed on October 19 by the National Insulate Co., of Springfield, Massachusetts, with liabilities \$13,839; assets \$7,610.

The Revere Rubber Co., of Providence, Rhode Island, has received a large order for solid tires to equip trucks being made for the French and Russian governments.

The United States Circuit Court of Appeals has affirmed a decree of the District Court in an opinion handed down in the suit of the Haskell Golf Ball Co. against the Sporting Goods Sales Co., for infringement of Patent No. 622,834, issued April 11, 1889, to Work & Haskell, on a golf ball. The court finds the patent of the complainant was valid and was infringed by the defendant. The patent covers a composite ball of rubber, the golf ball used for fifty years prior to that time having been made of gutta percha.

The Allen Auto Specialty Co., of New York, has brought suit against E. G. Baker, of the same place, for infringement of the Nathan tire case patent No. 799,622 owned by that company. Mr. Baker is the New York representative of the Gilbert Manufacturing Co., of New Haven, Connecticut, which manufactures tire covers, fleece-lined rubber covers and other accessories.

The Rubberset Co., Ltd., has been incorporated at Toronto, Ontario, with a capital stock of \$40,000 to manufacture rubber goods. Among the incorporators are J. W. Pickup, James Aitchison and Duncan McArthur.

The Chester Rubber Tire & Tube Co., of Chester, West Virginia, has purchased additional ground and will enlarge its plant.

The F. O. Small Co. has been incorporated in Boston with a capital stock of \$25,000 to manufacture and deal in rubber pulp, leather, etc.

The Atlas Rubber & Belting Co., of Cincinnati, Ohio, has increased its capital stock from \$1,000 to \$10,000.

The H. Phillips Rubber Co., of New York, has been petitioned into bankruptcy, with liabilities of \$12,000, and assets valued at \$8,000.

At a meeting of the consuls general in New York of Latin American republics, the Latin American Consular Association of New York was formed, the aim of which is to promote trade between the United States and the countries represented. Fifteen of the twenty Latin American consuls general in New York are members of this new association.

Employees of the Firestone Tire & Rubber Co., Akron, have contributed \$68 to the Red Cross Fund for the aid of the European war sufferers.

The Avon Tire Co., of Lynn, which recently purchased and moved into the plant formerly occupied by the Sagamore Rubber Co. at East Saugus, Massachusetts, is now operating, with a force of about 100 employees, turning out a line of solid tires.

The American Steel & Wire Co., which manufactures rubber covered and other wires, is planning the erection of a one-story building at the north works of its plant at Worcester, Massachusetts. This building will be 72x108 feet in area, and will be used for storage purposes.

A cable from London on October 1 stated that the embargo on the exportation of aniline oil had been raised.

In a recent address by the buyer for a prominent Boston shoe concern, manufacturers and retailers were jointly advised to make an effort to continue rubber soles and to push felt soles to the front "as a fad for the faddists who can afford them." It was stated that if 10,000,000 pairs of rubber or felt sole shoes could be sold next season it would greatly relieve the pressure on sole leather.

The Livingston-Hinkle Rubber Co. has been formed at Columbus, Ohio, by G. E. Livingston, former manager of the B. F. Goodrich Co.'s branch in that city. The new company will deal in automobile tires and accessories.

The Boston Rubber Shoe Co., of Malden, Massachusetts, is about to open a carriage cloth department, which will turn out a specially high grade of rubber ducks and drills, having ample facilities for manufacturing large quantities at short notice.

The Detroit Insulated Wire Co., of Detroit, Michigan, is enlarging its manufacturing facilities by the erection of two new buildings, respectively, 57x138 and 35x50 feet in area. The general offices of the company will be located in one of these additions, while the present office quarters will be used for factory purposes. Additional machinery equipment for the new buildings has been arranged for.

The Consumers' Accessories Co., of Indianapolis, has placed on the market a tire built exclusively for Ford cars. This is known as an over-size tire, the reason given being that the fabric and tread are 25 per cent. heavier than the ordinary tire of this type. It is made in two sizes only—30x3 and 30x3.5 inches—specialization in these two sizes minimizing cost.

The Parsons Non-Skid Co. and the Weed Chain Tire Grip Co., of New York, have secured an interlocutory decree against the Leather Tire Goods Co., also of New York, to restrain the latter company from marketing a device held to be an infringement of the Weed patents.

THE RUBBER TRADE IN AKRON.

By Our Regular Correspondent

THE output of the Akron rubber factories for the past month is roughly estimated to have been about 50 per cent of their maximum product. One or two plants are running on practically full time, with a full quota of men, while others are running on only part time.

This city has been the center of reunions and conventions during the month. Early in October there was a legislative reunion, when many of Ohio's legislators and officials interested in safety measures visiting the city were shown through the factory of The B. F. Goodrich Co. in an unofficial inspection of the safety devices and measures adopted by this company for the protection and welfare of its employees.

Then there was the annual sales convention of the Firestone Tire & Rubber Co., attended by about 250 out-of-town representatives. The branch managers arrived Tuesday, the 13th, and after a day spent in planning for the larger convention of the following two days, were tendered a banquet at the Portage Country Club. By the morning of the 14th all the regulars had arrived. The day was fully occupied, speeches of welcome being followed by general discussions of such important subjects as carriage, cycle, motor and pneumatic tires and rims, and by a visit through the tire factory. On Thursday, the 15th, a visit was made to the rim plant, and the subjects considered in con-

outcome upon the rubber trade, on account of the European war, will be. I am very optimistic myself, and look forward to an unusually prosperous year of 1915.

"The only uncertainty now is the source of the crude rubber supply. We had hoped that the English and French control of the sea would have cleared this up before now. There are two uncertain elements. One is our lack of merchant marine, and the other is the lack of trade between this country and the countries supplying rubber.

"As it is now, it is necessary for rubber to come through Europe, on vessels to go empty to secure the rubber, which makes the freight carrying cost and insurance very high. We will gradually shape ourselves to supply the things they want in exchange for the rubber, which will relieve the situation.

"It seems like America's opportunity. If our manufacturers and business men go about it properly, and seek to secure the trade of these Eastern markets, by furnishing to their people the things they want and need, in exchange for what we want and not try to establish an unhealthy condition by forcing upon them something we have a surplus of and they do not want, we will establish a trade relation that will be lasting and beneficial."

The Williams Foundry & Machine Co. has been exceptionally busy and is adding a one-story building 60 x 100 feet in area to its plant, at an estimated cost of \$12,000.

The new addition of the Adamson Machine Co. is nearing completion.

* * *

The Miller Rubber Co. has recently perfected and patented a



SALES FORCE OF THE FIRESTONE TIRE & RUBBER CO., AKRON, AT CONVENTION.

vention on this date included credits, export business, branch efficiency, advertising, the European situation and salesmanship. The dinner in the banquet hall of the Portage Hotel, which concluded the convention, was attended by about 400 Firestone men. One new feature at this year's convention was the publication by the company of a special newspaper containing the news of the proceedings. This was a paper called "Co-op," in regular newspaper form, two numbers containing four pages each, while a third had eight pages. Another innovation was the taking of motion pictures of the convention, 1,000 feet of film being used in this manner.

Some interesting figures have been compiled by the rim department of this company, from which we learn that in the past year's production of Firestone rims 12,000 tons of steel was used; that 400 mechanics and 16 electric welders are employed in this production, which requires 150,000 square feet of floor space, with 15,500 square feet of storage for the raw steel stock; that 1,000 box cars are utilized in carrying away a season's output of rims, and that from 10,000 to 50,000 rims are always carried in stock at the factory for immediate delivery.

Announcement has been made that the Firestone company will, this winter or in the early spring, build a three-story office and storage building on the site of the present office.

* * *

A letter of recent date addressed by Thomas F. Walsh, president of the Swinehart Tire & Rubber Co., of Akron, to an inquirer regarding the effect of the war on the rubber trade, contains the following interesting paragraphs:

"It is difficult at this time to state definitely just what the

valve to be used in toy balloons which permits of inflating and deflating as frequently as desired. By simply pressing the neck of the balloon the air is released and when retained in normal position the balloon remains inflated indefinitely. Composed of a hard circle of rubber, made cup shape in size to fit the neck of the balloon, with a small loose flap at the base, the whole is so simple that chances for it to become ineffective are reduced to a minimum.

This company advises all car owners who are about to store their cars for the winter to remove all tires from rims not of the quick detachable variety, and after slightly inflating both tire and tube wrap each in cloth and place it in a dry room having a temperature of about 50 degrees, the exclusion of light tending to preserve the life of the tire.

* * *

George S. Andrus is acting general manager of the Superior Tire & Rubber Co., which was lately incorporated under the laws of Ohio, with a capital stock of \$125,000. The company is at the present time having its inner tubes manufactured, but is using its own compounds and has its own sales agency. In the near future it expects to have a plant of its own in Akron, when it will take up other lines of rubber production.

All Southern branches of the Goodyear Tire & Rubber Co. have been instructed to purchase a bale of cotton and to exhibit it in their windows.

About 450 members of the Goodyear sales force have just arrived in town on special trains to attend the three-day convention which commences October 29.

THE RUBBER TRADE IN BOSTON.

By Our Regular Correspondent.

WHILE the various branches of the rubber manufacturing business differ widely as regards activity, the whole trade may be pronounced nearer normal than many other lines of industry. Crude rubber is being bought, and deliveries on contract are going forward, though the total consumption of crude gum is estimated at less than is usual at this season. The past season has been an excellent one for automobile tires, and while there is a curtailment of production at this time, such is to be expected at the close of the summer season. The unusually pleasant weather has extended pleasure riding much later than usual, with a corresponding wear and tear on tires, which must result in a greater demand, if not this fall certainly next spring, when general re-equipment is due.

The season in New England has made an extensive demand for garden hose, which has in its turn resulted in advance orders for spring deliveries far above the average. Belting and mechanical goods are not in so great demand. The call for druggists' soft goods is somewhat under the average. The clothing men have felt the effects of a tardiness on the part of the weather clerk to furnish the usual September and October rains, but a demand is noted for rubberized cloth for export, presumed to be for making up into ponchos and for covers for use on the European battlefields. The same is true of the rubber footwear business. The makers of this line have been busy right along, and orders which should have come in last spring and summer are now being received. Some factories have been shipping unusual quantities of boots abroad, which are rumored to be for the use of the British army. One company is making arctics on a government contract for the United States army. Several manufacturers of rubber soles report steadily increasing business, showing that rubber is in part relieving the leather scarcity in the shoe business.

[It was "some belt" which was recently shipped by the Boston Belting Co. to the France Stone Co. This was a conveyor belt



CONVEYOR BELT MADE BY BOSTON BELTING CO. AND PRESIDENT THOMAS A. FORSYTH.

such as is used for carrying crushed stone, ore, coal, etc. The belt was 83 feet long, all in one piece. It was 36 inches wide,

and was of 8-ply with extra thick rubber cover. Its size can be appreciated by the picture here shown with President Thomas A. Forsyth standing beside it. The belt weighed 12,000 pounds and its value was more than \$5,500.

* * *

Frederic C. Hood, general manager of the Hood Rubber Co., is one of the many American tourists who were in Europe at the time of the declaration of war. While he belittles his personal experiences, which were not sensational, as were those of less experienced travelers, still he tells an interesting story of his hasty trip across the continent from Italy to Norway and across the mine-infested North Sea to Scotland.

With his wife and son, he was touring the Dolomites in a motor car he hired in Munich when he first heard the rumors of coming war. These did not prevent the party from going to Venice, for three days' sightseeing. As they motored north through Verona in Italy, and Botzen and Landeck in Austria and thence to Munich, they saw a restlessness which foreboded trouble. From Munich they proceeded by rail to Dresden, where on July 31, things looked so serious that Mr. Hood decided to get out of Germany as quickly as possible, so arranged to take the five o'clock train to Berlin. Finding a train an hour earlier, they took passage in that, and arrived at the German capital on nearly schedule time, while the next train did not run for several days.

Berlin was in a fever of excitement. Every German knew where he was to report and what he was to do. The streets of Berlin were filled with soldiers, and with weeping women. Savings banks had hundreds of people in line withdrawing deposits. Taxicabs were breaking the speed laws. There was a great undercurrent of excitement, which the younger men showed by singing and marching and cheering. Tourists were hastening to get through Germany and Holland to England or America. The trains were being reserved for the army. Mr. Hood decided that a northward journey would be more practicable than going west, thinking that the "longest way round was the shortest way through." At the station the broad platforms were piled high with baggage; but a part payment in advance, and the rest when the work was done, enabled him to get his own trunks aboard the train, and the Hood family started for Copenhagen, where they arrived only a few hours late.

In Copenhagen the excitement was intense. Reports were current that the North Sea had been mined, and that the German fleet might soon bombard Copenhagen. Many steamship sailings to England had been abandoned. At the American Consulate hundreds of tourists were clamoring for assistance to get home or to England. Many Americans were booking steerage passages on the Scandinavian Line, but Mr. Hood decided to go to Christiana, Norway. Here he found the Norwegian army was mobilizing and transportation still uncertain.

When he tried to buy railroad tickets, he found he could get no money changed, as all the ticket agencies were out of cash. But a back door of a bank, the correspondent of the American Express Co., whose travelers' checks he had, was finally found, and plenty of money procured after a patient series of calls on the paying tellers. Thursday morning early, they left Christiana for Bergen over the beautiful Scenic Railway of Norway, and on the train he had good luck. A new law was passed that "alien enemies" could not land in England, and there were Germans on the train who had engaged passage to England, and who could not go to England, so Mr. Hood secured their reservation. A sample of the many "extra" expenses may be cited here, as the one-way fare on this boat was \$55, while the regular round-trip fare is \$32. The boat usually sails from Bergen to Hull, England, but on account of the mines the boat went to Leith, the port of Edinburgh, Scotland.

That trip was one of the worst experiences Mr. Hood ever encountered. The sea was rough. There were enough vague

rumors of mines to keep the nerves on edge, and in the middle of the voyage a submarine suddenly appeared near the boat and investigated the nationality of the steamer. The culinary department was in a chaotic state, the regular help having been called to arms, and their places taken by incompetents. Mr. Hood went into the kitchen and obtained food for himself and family.

When the boat arrived at Leith, it was thought their troubles were over. Not so. Orders had come that none but British subjects could land without permission from the Home Secretary's office in London. There were 40 Americans and two Belgians on board, and the boat was to sail on the return trip at midnight. A sentry with fixed bayonet prevented any one leaving the boat. The customs officers could do nothing, and the consular office was of no avail. Then Mr. Hood and others endeavored to induce the Chief of Police to arrest the whole party, and thus save them from deportation; but the police were powerless. Finally, after a delay of over ten hours after arrival at Leith, a telegram came from London and the passengers were allowed to land on British soil late Saturday evening. Mr. Hood went to London by sleeper, arriving there Monday morning, eight days after departure from Berlin. Even at that, he was ahead of some of those who took the "direct" route between the two cities. Not so exciting as some other Americans' experiences, but sufficiently so.

* * *

The Atlantic Rubber Co., now at Hyde Park, has commenced the construction of a factory near Atlantic Station in Quincy. The plans, which are from the office of J. O. De Wolfe & Co., the well known rubber mill architects, call for a three-story brick building of mill construction and so designed that additions can be made, when desired, in conformity with the original style. This company manufactures rubber-coated fabrics for the cutting-up trade, sheeting and molded goods, besides some specialties in the latter line. Mr. Alfred A. MacLaren is treasurer and manager.

* * *

The boot and shoe mill of the Apsley Rubber Co. at Hudson was shut down one week for the purpose of installing heavy electrical machinery. For some time past all the outlying departments of the plant have been operated by electric power. With the completion of this installation the main mill shafts and all power for the boot and shoe departments are run by motors. The entire plant now has electric power. One of the motors just installed is of 500 h. p. and weighs over five tons.

The company will effect important economies in its power department resulting from the present installation, together with increased efficiency and uniformity of speed.

* * *

To meet the growing demand for a substitute for sole leather, the Tyer Rubber Co., of Andover, has been engaged in experimental work for several months past in an effort to produce a vulcanized fibre compound which will fulfil all the requirements of leather. The experimental work has now reached a stage where the company feels justified in offering to the shoe trade a material which is claimed to be fully equal in every respect to sole leather.

This compound can be manufactured by exactly the same methods now employed in connection with sole leather and as its various ingredients can be obtained in unlimited quantities, the price will not be subject to the wide fluctuations often prevailing in the sole leather market.

* * *

It may be remembered that James Brien, proprietor of the Eastern Rubber Co., of this city, was killed in an automobile accident a few months ago. Since that time the business has been continued by the estate of Mr. Brien, until last month, when a corporation was formed under the name of

the Eastern Rubber Co., with an authorized capital stock of \$90,000 in 900 shares of \$100 each. The officers and incorporators are: Christopher Brien, president; Fred C. Miskelly, vice-president; Harriet C. Brien, treasurer, and Jane A. Hay, clerk. The corporation assumes all indebtedness of the business.

* * *

Joseph L. Whiton, salesman for the Congress Shoe and Rubber Co., has become mayor of the neighboring city of Quincy, for the unexpired term of the late Mayor Miller, who died early last month.

THE RUBBER TRADE IN CHICAGO.

By Our Regular Correspondent.

IN some branches the rubber business has improved during the past month; in other respects it is not so good. For the most part the improvement has come in the rubber tire business. This is due to the fact that the weather throughout the Middle West has been ideal for motoring. There have also been half a dozen big races during the month, which aroused great interest and gave an added impetus to the growing sport of motoring. The prize races at Indianapolis, Elgin and Galesburg brought out a large number of cars and served to revive demand in the tire line.

While the automobile tire business has prospered, however, the mechanical rubber goods lines and the rubber boot and clothing lines have not been meeting with such a heavy demand. The reason is not far to seek. Industrial conditions throughout the West and Middle West are far from being as good as they might be. Many factories, owing to the war, are not running full force, while a few of them have closed down. The mines are not working as briskly as usual at this time of the year. This means that the sales of rubber belting and packing have decreased. The rubber clothing business has been a little off owing to the fact that the weather has been too mild to move goods from the shelves of the dealers. As a result the jobbers are marking time and waiting for wet weather to set in.

A. Romain, sales manager of the Quaker City Rubber Co., discussed the situation with his usual optimism, but was frank in admitting that conditions in the mechanical rubber line were a little unfavorable just at present. "But," he added, "I believe that the sunny side for mechanical rubber houses in this city lies in the possibilities of export trade, owing to war conditions. We have recently received some letters of inquiry from large buyers—I will not say from where, but they required translation—and these have served to show us that there is more trade than has been suspected waiting for rubber manufacturers of this country if they care to go beyond the national borders to capture it."

* * *

L. L. Murphy has succeeded W. E. Carver as sales manager of the Rubber Distributing & Manufacturing Co. Mr. Carver is no longer connected with the firm, but will not leave the rubber business, it is understood. In discussing the situation in the rubber boots and clothing line, Mr. Murphy made the following points: "The dealers carried over very few goods through the summer. This is true throughout the Middle West. While things are a little slow right at this time, I expect business to improve with a rush as soon as we have some bad weather. One year ago today we had snow. We have not had any snow thus far this year, and the weather has been clear and mild. With the first rainy spell the stocks of the dealers will be depleted to the extent that they will be forced to place orders at once. Just at present while waiting we are getting ready for the rush that is certain to come."

* * *

J. E. Duffield, manager of the Thermoid Rubber Co., went to Galesburg, Illinois, to attend the auto races recently held in that

city. He had a particular interest in these races, as two of the leading drivers, Bob Burman and Ralph De Palma, used "Nassau" tires on their machines. Mr. De Palma won the race at Indianapolis, which is one of the big sporting events of the West, with these tires, while Bob Burman has used them for two years, winning in many of the events he has entered. Mr. Duffield believes that there is great advertising value in auto races. "Nothing calls the attention of the people to tires like the front page newspaper accounts of auto races," he said, "for it is upon tires that a race largely depends. Without the proper sort of rubber in tires, trouble is certain to come."

L. L. Bucklew, who was recently appointed special representative of the Department of Commerce of the United States Government, was in the city last week talking with a number of the leading rubber men. He leaves in a few days to spend a year or more in the study of commercial conditions in South America. Local rubber men told him, as well as they could, just what it was that they wanted to learn. Upon his return Mr. Bucklew will file his report with the government, and the result of his labors will be made public. Rubber manufacturers here are all the more interested in Mr. Bucklew's mission owing to the fact that an all-water route from Chicago to the Gulf of Mexico will soon be a fact. It requires only the deepening of 60 miles of canal which forms the connecting link between the Chicago river and the head-waters of the Illinois river.

* * *

W. H. Salisbury & Co., Inc., have just entered upon the sixtieth year of their career as rubber merchants in this city. This company has been continuously in business since its establishment in 1855, though many changes have of course occurred in its personnel. A folder recently distributed by the company, calling attention to the various lines of rubber goods—hose and accessories, belting, packing, tiling, drug and hospital supplies, molded goods, etc.—carried in stock, announces that the company is "59 years old and proud of it. Not just proud of years, but of the fact that we have so long enjoyed the confidence of the trade," and states that they propose to round out their sixtieth year with nothing left undone for the good of their customers.

* * *

Ross White, formerly manager of the Goodyear Tire & Rubber Co. branch at Columbus, Ohio, has been transferred to Chicago as manager of the branch in this city; while C. M. McCreery, former Chicago manager, has been promoted to the position of assistant to H. P. Ziegler, manager of the Western district.

* * *

I. W. Penniman has been appointed Western sales manager of the Walpole Tire & Rubber Co., of Walpole, Massachusetts, with headquarters in the Brooks building, this city.

THE RUBBER TRADE ON THE PACIFIC COAST.

By Our Regular Correspondent.

THE tire manufacturing industry on the Pacific Coast is soon to be extended by the addition of another factory competing for the business of this territory. The Halliwell Co., formerly agent for the Knight Tire & Rubber Co., of Canton, Ohio, has decided to go into the manufacturing end of the business, making a line of motor vehicle tires but specializing in sizes for Ford cars. D. W. McElligott, manager of the company in San Francisco, states that it is for the purpose of developing home industry and at the same time keeping a big share of the tire business on this coast that the company has made plans to manufacture Halliwell tires here.

* * *

The Fisk Rubber Co., of Chicopee Falls, Massachusetts, early in October opened its tenth store on the Pacific Coast,

at 725 South C street, Tacoma, Washington. This branch is in charge of C. H. Underberg, who was formerly manager of the San Francisco office.

The year 1915 will probably see a larger number of visitors in the West than ever before and it is the aim of the Fisk company, through its various branches, to be in a position to supply all the requisites of the automobiling tourists as well as information regarding routes, road conditions, etc. The resorts along the San Joaquin & Eastern Railroad to Big Creek, Kings River Canyon and General Grant Park, as well as the north fork of the San Joaquin, are said to be attracting large numbers of motorists, and the views to be seen from the roadways on the sides of the mountains are described as magnificent.

In support of his claim that the automobile is not only an efficient, but an economical means of transportation, Mr. H. B. Pratt, Pacific Coast manager for the Fisk company, cites an instance where a jury in a certain case being tried in Seattle, and a number of witnesses were ordered taken from the court room to inspect a road a mile and a half long not far from the city. The expense of such a trip by hired automobiles would have been \$79.50, but a similar previous trip having been criticised, this one was made by street car, at a cost of \$205.50.

* * *

John S. Weise, for several years manager of the United States Tire Co.'s Los Angeles branch, has been appointed sales manager of the local factory of the Winton Motor Car Co.

* * *

The Jones Auto Supply Co., of Oakland, California, has taken an agency for Republic tires. The products of the Republic Rubber Co. have until now been handled exclusively in this city by the Imperial Garage & Supply Co., but as the interest in motoring increases it becomes necessary also to increase distributing facilities for tires and other accessories.

THE RUBBER TRADE IN RHODE ISLAND.

By Our Regular Correspondent.

THERE has been comparatively little change noted in the rubber industry in this state during the past month, the various plants, according to the lines of goods produced, experiencing diversified conditions. There is a very optimistic feeling among the managers of the local plants, however, that there will be a general reawakening of business within a short time that will start up the idle machinery that is to be found in some of the plants. The rubber shoe workers are running full time, with orders ahead, and there has been a slight improvement in the wire departments. The automobile accessory makers are still behind normal, but are looking for an early improvement. The makers of special surgical and druggists' supplies are reported as being very busy, with some orders coming in from abroad that will keep them going for the rest of this year, at least.

* * *

Materially interested in everything that pertains to the settlement of the difficulties of the Walpole Tire and Rubber Co. because of the close affiliation of the affairs of this concern with those of the Atlantic National Bank, of this city, and the Consumers' Rubber Co., of Bristol, the action of the Federal Court, at Boston, on October 19, in again postponing the sale of the Walpole plant, is generally commended.

The matter of fixing the date for the sale of the Walpole company property was put forward, upon the recommendation of the receivers, in concurrence with counsel of the stockholders, to January 4, 1915. Leave was granted to interested parties to bring the matter before the court on ten days' notice. The

hearing was held before Judge Dodge in the United States District Court in Boston.

The receivers stated that the business of the company had continued to be good, both orders and sales, as a whole, being in excess of the corresponding months of last year and that prospects are excellent for a continued good business during the winter months. Permission was granted the receivers, upon their petition, for the payment of a fourth dividend to the creditors, amounting to 10 per cent., for which they have in hand the sum of \$125,000. This makes a total of 22 per cent. that will have been paid in liquidation of the approximately \$1,250,000 claims that have been allowed against the company. Dividends of 4 per cent. each were paid on March 14, June 1 and July 27.

On the subject of a sale of the Walpole property, counsel for the receivers stated that they had consulted numerous financial interests and were told that conditions are not likely to be propitious for selling the property for some months to come.

A new factory building is being erected on land between Brook and Whitehill streets, in Taunton, to be occupied as a new home for the Taunton Rubber Co. The new building will be more than 100 feet long and 50 feet wide, and will also have a large wing, the whole structure being of brick and glass. Facilities will be afforded for more than a hundred operatives, and the capacity will be not less than 24,000 rubber heels a day.

The Hospital Rubber Co., of Attleboro, has been incorporated, with a capital stock of \$100,000, and has removed to larger quarters in the Bushee factory building, where it is occupying the ground floor. The incorporators are George J. Kelley, Mrs. Geraldine S. Kelley and Miss Lydia D. Peck.

The employes of the Revere Rubber Co. have organized a six-team shop bowling league, representing the Accounting, Cost, Thread, Solid Tire, Stock and Shipping departments.

Seven Oaks, the residence of former-Governor Augustus O. Bourn, of the Bourn Rubber Co., at Bristol, was considerably damaged by fire recently. Mr. Bourn was at his office in this city, while Mrs. Bourn, who is an invalid, was in the house, but was assisted to a place of safety, although her nurse was nearly overcome by smoke.

On October 11 about 100 employes of the Davol Rubber Co., of Providence, Rhode Island, with their friends, held an outing at Emery Park, not far from that city. Outdoor sports were a feature of the outing, including a baseball game in which the team composed of married men were victorious over their unmarried rivals. The outing was an all-day affair, and at 12:30 the party was served with chicken chowder, while at 4 o'clock they enjoyed a roast chicken dinner. Musical performances at the Colonial Casino and the Old Tyme Inn were attended by many members of the party.

The factory of the National India Rubber Co. at Bristol, is shipping a large lot of rubber shoes, several carloads leaving the works each day. The wire insulating business of the company is growing better as the fall advances, and already large shipments are being made of this product.

Manager Chris. A. Ostby of the company's baseball team was recently presented with a handsome silver loving cup by the members of the team who played during the season. The names of all the members of the team are engraved on the cup.

A NEW RUBBER GOODS FABRIC.

A new fabric for which superiority is claimed is soon to be employed by the Goodyear Tire & Rubber Co., of Akron, Ohio, in certain of its products. This fabric is the invention of Lawrence A. Subers, of Cleveland, Ohio, and is described as a "laminated cohesive interwoven fabric."

TRADE NOTES FROM TRENTON.

THE Roberts Aeroplane Co., which has been incorporated under the laws of this state, will erect a factory at Blackwood, New Jersey, for the construction of biplanes.

The Reliable Tire & Rubber Co. has been incorporated here to manufacture and deal in automobile tires, tubes and other rubber products. The capital stock of the company is \$24,000, and the incorporators are: Arthur R. Colvin, Erastus L. Irving and Albert Numbers.

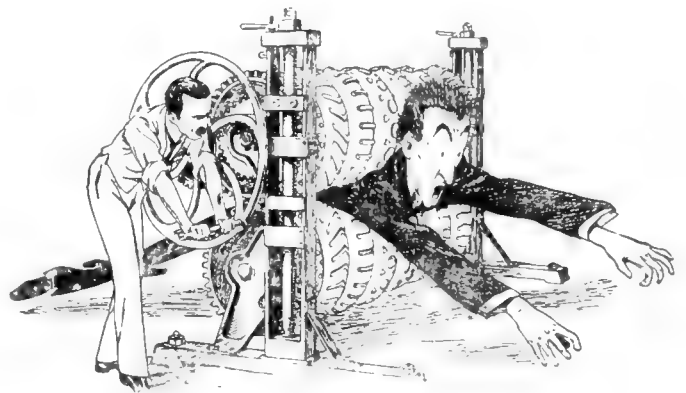
The Braender Rubber & Tire Co. is building a four-story fire proof addition to its plant at Rutherford, New Jersey. This addition, which is 129 feet long and 141 feet wide, will be equipped with all the latest machinery adapted to the manufacture of tires and tubes and will increase the capacity of the plant to approximately 1,000 tires and tubes each per day.

October 19 was a date of special rejoicing in the home of J. Cornell Murray, vice president of the Empire Rubber & Tire Co., of this city, the occasion being the birth of a son.

A 2,000-ampere power station is being built in this city by the Wright Electric Co., adjoining the factories of the United & Globe Rubber Cos. and the J. H. Smith Co. Both of these concerns have found night operation of their plants necessary in the production of tires in required quantities, and the erection of this modern electric plant will enable the companies to operate night as well as day shifts besides effecting a considerable saving in power cost.

THE MICHELIN IDEA OF ROUGH TREADS.

The Michelin company has always been a staunch and persistent advocate of the smooth tread. All treads with any sort of pattern this company has always referred to as "sculptured tires," and sculpture on the tread of a tire, it asserts, is



waste, pure and simple. Here is a cartoon recently promulgated by the Michelin company showing the unhappy consumer being squeezed by the "sculptured" treads.

THE MOHAWK RETREAD BAND.

The Mohawk Rubber Co., of Akron, Ohio, is now manufacturing a non-skid retread band. This band is endless and is molded into shape, so that it fits the casing perfectly. It is semi-cured and has a layer of pure gum on the inside, where it comes in contact with the casing, which makes buffing easy and gives the cement the proper hold to prevent separation. In applying the band it is cemented, buffed, wrapped and cured. The tread design is the same as the pattern illustrated on page 316 of THE INDIA RUBBER WORLD for March, 1914.

THE OBITUARY RECORD.

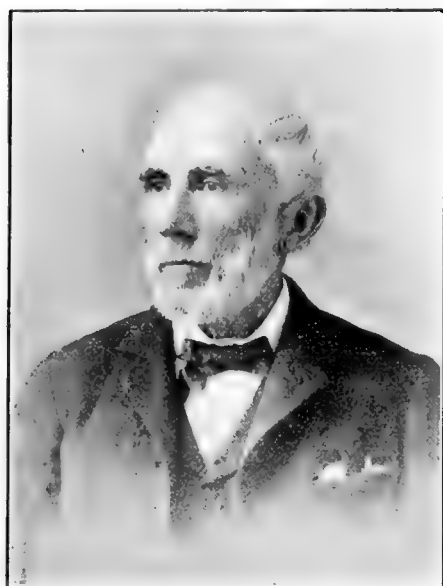
HENRY P. DAY.

THE American rubber industry lost one of its pioneers and veterans in the death of Henry P. Day, which occurred at his home in Seymour, Connecticut, on October 9, in his eighty-sixth year. For nearly sixty years he had been associated with his brother in the manufacture of hard rubber pencils, penholders, fountain and stylographic pens and other specialties. He was one of the first to take up the manufacture of hard rubber and during the greater part of his long life was identified with this industry.

Mr. Day was born in West Springfield, Massachusetts, March 12, 1829, the son of Julian Day and Lois Goodyear, a cousin of Charles Goodyear. He attended the public schools of that place until the age of 14, when he went to Ohio and became associated with an uncle in the manufacture of paper.

When he reached the age of 21 he joined the great gold seeking

caravan and went to California, remaining there for three years. In 1854 he returned to the East and settled down in Seymour and with his two brothers, Austin and Edmond, embarked in the rubber business, their first work being confined chiefly to the cleaning of rubber. But very soon they began the manufacture of hard rubber goods and insulated wire cables. Their business increased to such an extent that about ten years later, in 1866,



HENRY P. DAY.

it was divided, the brother Austin taking over the insulated wire cable manufacture while Henry and Edmond continued the manufacture of hard rubber, under the firm name of H. P. & E. Day. He was active in this industry up to a few days of his death.

He was a man of the highest character and possessed in a marked degree that sterling integrity which New Englanders are always proud to feel is a characteristic of the old native stock. He was greatly beloved by his employees, some of whom had been associated with him for half a century. He was public spirited as a citizen and with his brother Edmond recently donated a free public library to the town of Seymour.

He was married in 1865 to Miss Fannie Gilbert, who, with two sons—Julian Gilbert Day, of Derby, Connecticut, and Henry Goodyear Day, of New Haven—survives him.

TRADE OPPORTUNITIES FROM CONSULAR REPORTS.

A firm in the East desires to be placed in communication with American manufacturers of india rubber tires for carriages. It is stated that if the firm can secure proper connection a considerable amount of business will result. Prices—which should be quoted f. o. b. shipping port, or preferably c. i. f. destination—discounts and terms should be sent, in English, when references will be furnished. Report No. 13,877.

A manufacturers' agent in the United Kingdom wishes to secure agencies for American rubber shoes. English and American references will be furnished. Report No. 13,899.

A highly reputed house in the United Kingdom wishes to secure names and addresses of American makers of zinc oxide, dry white and red leads, being prepared to buy outright c. i. f. destination or to act as buying or selling agents. Report No. 13,922.

A firm in southern Europe wishes to represent an American firm exporting rubber for automobile tires. Report No. 14,055.

A European firm handling paper of all kinds, rubber tubes, sponges and rubber mats, desires to act as agent for American manufacturers. Correspondence may be in Portuguese or French. Report No. 14,033.

A firm in the East Indies desires to place an order for American waterproof canvas. This firm will require a very large quantity of canvas, and prices, etc., and time of delivery of 10,000 yards of each quality desired should be submitted at once. Samples forwarded by the consular officer may be inspected at the Bureau of Foreign and Domestic Commerce, Washington, and at its branch offices. Report No. 14,034.

A foreign consular officer resident in the United States wishes to receive names of American manufacturers of rubber hospital supplies and surgical instruments. Report No. 14,147.

A company in the United Kingdom requires considerable quantities of compressed ebonite for high-tension insulation for magnetos for internal-combustion engines. Report No. 14,149.

An importing firm in the United Kingdom desires to purchase pigments such as white lead, zinc oxide, lithopone, etc. Report No. 14,161.

A company in England wishes to secure agencies for American manufacturers of Chemicals. Report No. 14,162.

A manufacturer and importer of elastic goods in South America desires to secure samples, quotations, etc., regarding thread rubber for weaving elastic goods; twisted and artificial silks and twisted cotton thread for weaving elastic goods; also raw glue and raw dextrine, and catalogs of machinery for this line of manufacture. Correspondence should be in Spanish. Report No. 14,183.

THE MADEIRA-MAMORÉ RAILWAY IN A RECEIVER'S HANDS.

The Madeira-Mamoré Railway whose early history and marked vicissitudes have been set forth in these columns from time to time, was placed in a receiver's hands on October 13 by the Federal Court at Portland, Maine. This was done on the complaint of Deane Mann, of London, England, who owns something over \$100,000 of the company's bonds, the interest of which, according to his claim, due on the first of October, was not paid. The railway company admitted the allegations in the complaint and joined in a petition for the receivership.

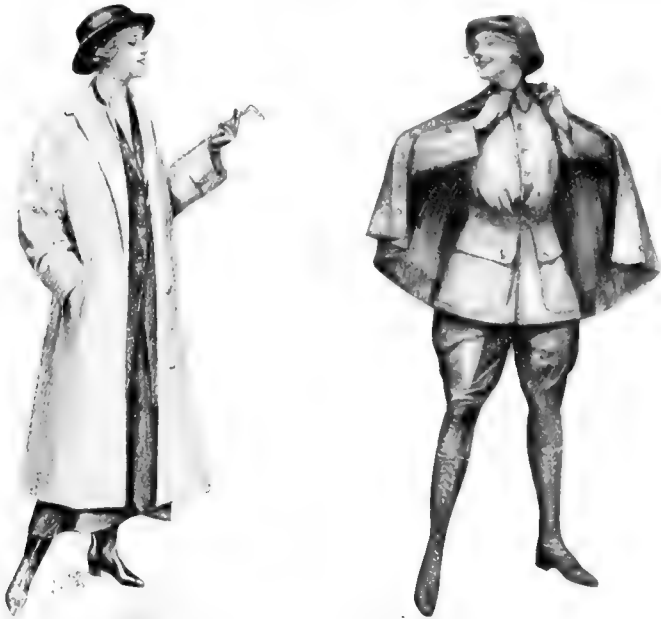
The Madeira-Mamoré Railway was organized in Maine in August, 1907, and the controlling company, The Brazilian Railway Co., was organized in the same state about a year earlier. The two companies have outstanding capital of \$63,000,000 and it is said that their indebtedness exceeds \$118,000,000. In a general way, the cause that necessitated the receivership was the prostration of business in the Amazon country and particularly the low price of rubber which made the operation of the Madeira-Mamoré road unprofitable. The immediate cause of the company's trouble was its inability to obtain \$10,000,000 said to be due the Brazilian Railway from the Brazilian Government.

Just how much rubber business this road will have in the future, is problematic, but with the general development of northern Bolivia and particularly with the opening up of its gold fields, it is by no means impossible that this little strip of railroad, hardly more than 200 miles long, which involved such a disproportionate outlay of money, not to mention the sacrifice of human lives, may some day make some adequate return for its great cost.

New Rubber Goods in the Market.

WATERPROOF SPORT AND HUNTING CLOTHES.

THE white rubber raincoat illustrated is made with fan fullness in the back, so that it may be worn in the saddle, for which purpose it is intended, as well as for use of the motorist.

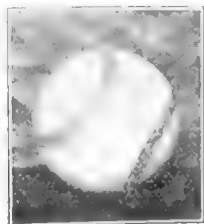


The second illustration shows a hunting suit. This suit, which is made of waterproof Forestry cloth, consists of coat, knickerbockers and a convertible garment which may be used either as a skirt or cape. A hat of the same material completes this very practical outfit.

Sport coats of various other designs are being made in such light weight materials, as rubberized cashmere and rubberized crêpe-de-shine, and of rubberized Mercerized Cantonina.

HOLLOW RUBBER BALLS OF NEW DESIGN.

The rubber ball is no particular novelty. In fact, all the writers on rubber history mention the interesting incident where the Europeans who followed immediately in the wake of Columbus discovered the South American Indians playing with rubber balls. But here are rubber balls of new design. They are all hollow. The first ball,



which is $3\frac{1}{2}$ inches in diameter, may properly be called an alphabet ball, as it has a raised band around the center on which appear all the letters from "A" to "Z." These letters are embossed and colored so as to make them quite conspicuous, the idea evidently being that while the youngster is deriving amusement from playing with the ball he is quite unconsciously absorbing his letters. The raised letter idea is also carried out in the other $3\frac{1}{2}$ -inch ball, on which are molded the words "Merry Christmas."

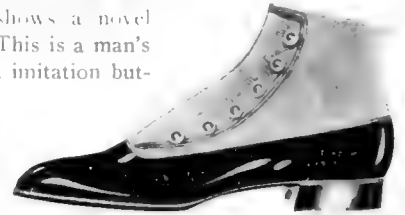


The smallest of the three balls, which is $2\frac{1}{2}$ inches in diam-

eter, is in its design an imitation of the ordinary baseball so dear to the heart of every American boy.

IMITATION BUTTON SHOE WITH ALL GORE TOP.

The substitution of cloth and other materials for leather in shoe tops is a distinctive feature of this season's sample lines, inspection of which shows several styles in which goring forms the material of substitution. The accompanying illustration shows a novel example of this feature. This is a man's shoe with an all gore top, imitation button, designed to slip on over the foot in regular boot style. In appearance it looks exactly like a cloth top shoe, while having the advantage of a much better fit. [Hub Gore Makers, Boston.]



RUBBER REQUISITES IN THE GENTLE GAME OF FOOTBALL.

Rather strenuous sport is the American game of football. At the close of each season the statisticians compile the number of casualties that have occurred on the different college campuses. These figures are usually rather startling, and they would be much more so if it were not for the various rubber protectors that have been devised to save the players from further maiming. Here are illustrations of two of these protecting devices. One of the accompanying cuts shows the Morrill Nose Mask. This protector is made of the finest quality of rubber, fits over the nose snugly, but leaves a place for ventilation, and is fastened around the head. It saves many a player from going through life with more lumps on his nose than nature originally provided.



The other cut shows a mouthpiece for the football player. This also is made of rubber and has three ventilating holes. It enables the player to come out of a game with all of his teeth, a condition that would hardly be possible without this rubber protector.



A BOXER THAT ALWAYS "COMES BACK."

The illustration shows a boxer that all other boxers must look upon with great envy, for he always comes back, and not only that, but comes back immediately. He may be knocked down repeatedly but he never takes the count. This boxer is known as "Spalding's Fighting Dummy," and from the waist line up he consists of an interior rubber bladder, highly inflated, held in place by a hidden steel frame and covered with heavy brown canvas. The feet are fastened in a heavy T-shaped iron base, which causes the figure to maintain an upright position and to resume it at once on being knocked over. The great advantage of this device is that it enables anybody to do solo boxing, a great convenience on getting up in the morning or going to bed at night, when a human boxing mate may not be available. [A. G. Spalding & Bros., New York.]

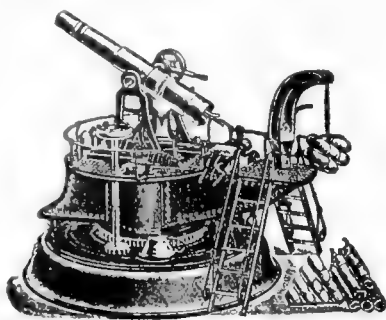


ONE WAY TO PRESERVE RUBBER ARTICLES

A correspondent writes to the "Pharmazutische Post" in regard to a method he has discovered for preserving rubber articles. He gives the articles a thin coating of glycerine and then puts them in a tight receptacle in the bottom of which there is kerosene. The rubber articles are put on a rack above the kerosene and are exposed to its vapor. This process, in his experience, gives the rubber a surface which preserves it.

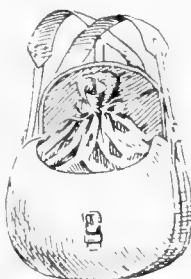
A TOY COAST GUN WITH RUBBER PROJECTILES.

Probably Secretary Bryan would not approve of the toy that is herewith illustrated, for it is a military mechanism of most dangerous aspect. But toy guns have, unfortunately, always seemed to appeal to the masculine young, and are likely to retain a prominent place, particularly in war times, among the articles produced for youthful diversion. This gun, however, is not as formidable as it appears, for the projectiles used are made of rubber and can be hurled promiscuously around the room with perfect safety.



A RUBBERIZED CARTRIDGE BAG.

It is eminently desirable—as already remarked by divers people—that one's powder should be kept dry. Here is a cartridge bag expressly for such a purpose. It is made of waterproof sateen and so contrived that the cartridges once in it cannot be affected either by rain or damp. The bag has a double top, the inner one being soft and pliable and susceptible of being pulled together with a gathering string and tied very tightly. Over this there is a flap that is held down by a buckle on the side of the bag. With this double protection the cartridges are immune from any dampness. The bag is equipped with straps for convenience in carrying. [J. P. Cording & Co., London.]



A MOTORCYCLIST'S RAIN SUIT.

Here is a Scotch idea of a motorcyclist fully protected against the fiercest storm. This suit is made of strong khaki or dark fawn twill of double texture, with rubber proofing. The jacket, which is double-breasted, is long, coming well toward the knees. It has a storm collar and adjustable elastic cuffs. A pair of trousers or overalls of the same material completes the outfit and gives the motorist ample protection under all conditions. [The Scottish India Rubber Co., Ltd., Glasgow.]



A WATERPROOF GOLF CLUB BAG.

Golf clubs may not be seriously damaged by an occasional wetting, but they are certainly not improved by it. The owner of a choice set of clubs naturally prefers to keep them dry. An Edinburgh company has put on the market a golf club carrier which is made of waterproof material, an illustration of which is here given. It will be noticed that the carrier is equipped with a hold fast handle. [William Currie & Co., Edinburgh.]



RUBBER SOLE WITH LEATHER TOE PATCH

The old order has been reversed, and in place of the leather sole with rubber patches or plugs we now have the rubber sole with a leather patch. This new rubber sole extends the entire length of the shoe. The leather patch, which begins at the toe and extends back about 2 inches, running either

straight across the sole or on an oblique line, is flush in thickness with the rest of the sole, the rubber under the leather patch being made considerably thinner than the rest of the sole. The rubber and the leather are joined together on a beveled line. [Flexible Rubber Goods Co., Salisbury, Connecticut.]

RUBBER IN ATHLETIC ACCESSORIES.

One of the newest athletic accessories is a union suit, as shown in the accompanying illustration, the jacket and pants portions of which are joined at the waist by a wide elastic webbing belt. This suit is made of tan army khaki and has the usual knee and hip pads and thigh guards.



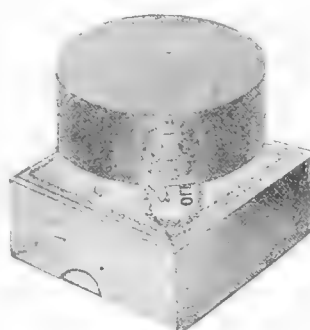
A new outdoor basket ball is also now being marketed, the wearing qualities of which are claimed to be superior to any other style yet produced. The new feature of this ball is that the sections of the leather casing are turned outward, making out-seams. The wear on a basket ball being chiefly on the seams—contact with rough surfaces such as cement, cinders, etc., quickly wearing the thread through and causing the seams to rip—an out-seam is supposed, by preventing such wear, to indefinitely prolong the life of the

ball. An inflatable pure gum bladder is supplied with each leather casing, and the ball is laced with a rawhide strip. This new ball has been adopted by many of the playground and outdoor associations throughout the country. [The Draper-Maynard Co., Plymouth, New Hampshire.]



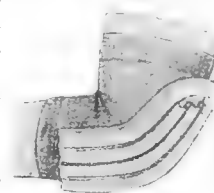
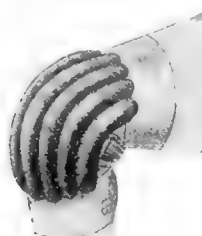
A RUBBER HOCKEY PUCK.

The Spalding "Official" hockey puck here illustrated has been adopted as the official puck of the Canadian Amateur Hockey League, for use in all match games. It is made of rubber, thus eliminating in a measure the possibility of accidents or injury to the players. [A. G. Spalding & Bros., New York.]



KNEE AND ELBOW PADS.

Knee and elbow pads for use in athletic sports are now being made with attached elastic bandages. This is an improvement over the old style for, while the pads afford protection against knocks and hard bumps, the bandages provide support for the knee and elbow and hold the pads in place. The knee pad illustrated is made with leather cover, in roll style, while the elbow pad is made of felt strips—both with elastic bandages at either end.



AIR PUMP CONNECTION RUBBER.

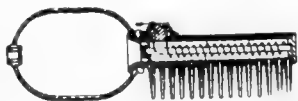
The Romort air pump connections, for use on hand and foot pumps, spark plug and auto tire pumps, will not blow off the tire valve nor turn inside out. They are used in public air stations, garages and vulcanizers wherever air is used. It is all due to the novel design of the little rubber gasket illustrated above. This is the principal feature of the Straight Pump Connection, Automatic Air Valve and the Angle Pump Connection made by the Romort Valve Co., Seattle, Washington.

**PROTECTING THE SINK FROM THE DISH PAN.**

An enterprising manufacturer of tinware has just introduced to the trade a new form of dish pan which should make a strong appeal to the practical housekeeper. This pan is rectangular in shape and so will fit down into the sink. Also, it will be noticed that an outlet is provided in the bottom of the pan—stopped by a rubber plug similar to those used in bath tubs—while a small strainer drawer of rustless galvanized mesh catches any grease or refuse in the water. This drawer slides out and can easily be cleaned. Another feature of the pan is the rubber plugs inserted at the corners to raise it from the bottom of the sink and to prevent scratching of the porcelain. [Ammidon & Co., Baltimore.]

**A HOT-AIR COMB TO DRY THE HAIR.**

Drying the hair deprives a great many women, particularly those addicted to seaside resorts, of many hours of time which might otherwise be turned to some useful purpose. All this tedious drudgery can now be avoided by the use of a simple device, provided there is an electric light attachment conveniently at hand. This device consists of a comb in the back of which there is an electrical heating unit. The teeth are hollow, while at one end of the comb there is a soft rubber bulb, as shown by an outline in the accompanying drawing. When the comb is to be used it is attached to the electric light fixture and the compression of the bulb sends the air over the heated electrical coil down through the teeth of the comb into the hair. This continual supply of heated air naturally greatly expedites the drying process.

**PNEUMATIC STAGE SCENERY.**

Stage scenery which, while being more than ordinarily realistic in appearance, is more easily portable than the old time styles, has been produced, in the form of objects made of air-tight fabric. This scenery may be quickly inflated and when collapsed it occupies very little storage space or may be shipped from one point to another with slight trouble and expense. Trees reproduced in this manner are said to be wonderfully effective, even from a short distance.

FLESH-REDUCING RUBBER GARMENTS.

On page 322 of the March, 1913, number of THE INDIA RUBBER WORLD, mention was made of Medicated Rubber Garments designed and patented by Dr. Jeanne Walter, of New York, for reducing flesh. To her line of union suits, stockings, jackets, wrinkle eradicators and other rubber garments for men and women, Dr. Walter has recently added a bust reducer, made from her reducing rubber, with coutil back.

THE SILENT TIP

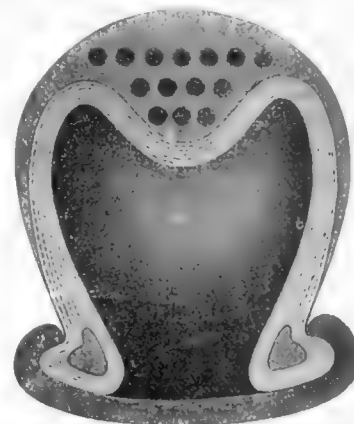
This small cut shows a new furniture tip of which rubber is an essential component. This tip consists of three parts—a small crimp or casing, a rubber bumper or cushion and an ordinary screw. The rubber is vulcanized in the metal part with the screw in place, and acts as a silencer, while the smooth surface of the metal glides over the floor without leaving a trail of scratches. [The Silent Tip Specialty Co., 317 Sweetbriar street, Pittsburgh.]

**THE "PARAGON" CHANGING BAG.**

A new style of bag for changing plates or remedying defects in hand camera photography has lately been placed on the market. This bag is confidently recommended by its manufacturers as "a thoroughly well made, practical and durable article." It is made of three thicknesses of proofed woven fabric. As will be seen by the illustration, the sleeves are conveniently located to give perfect freedom to the arms. The eye-piece is fitted with ruby glasses through which the interior of the bag may be seen, while a window of unbreakable material affords safe and sufficient light. [Houghtons Ltd., 88 High Holborn, London, W. C.]

**PNEUMATIC TIRE WITH A CABLE TREAD.**

A tire of unusual construction, known as the Cable Pneumatic, is shown in the accompanying illustration. The tread is made with a thickened portion extending inwardly and having a number of flexible steel cables inlaid in it during its manufacture. These are said not to detract from the resiliency, but to strengthen the tread. They are so placed as to make the tire puncture proof, since they stop any sharp instrument piercing the outer cover. When the inner tube is inflated it has two high shoulders which provide a cushion effect. [C. T. Brown, 258 Broadway, New York City.]



CROSS SECTION OF THE CABLE TIRE.

WIND-SHIELD WEATHERSTRIPS.

To eliminate the possibility of rain coming through the space between the upper and lower halves of automobile windshields, and consequent annoyance, a weatherstrip has been invented, adjustable to all shields regardless of thickness of glass or space between the sections. The strip, which is of rubber and less than an inch in width, is made with a flange on one edge which fits over the lower section of glass and forms a perfectly watertight connection. It is easily adjusted and, although not wide enough to obstruct the vision at any time, may, if desired, be carried under the seat of the car in fine weather.

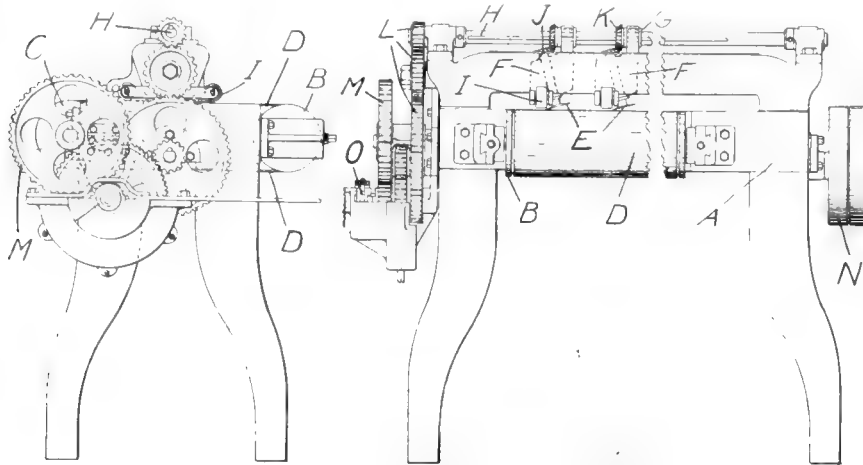
Replete with information for rubber manufacturers—Mr. Pearson's "Crude Rubber and Compounding Ingredients."

New Machines and Appliances.

MACHINE FOR SKIVING INNER TUBE STRIPS.

WHERE the edges of rubber strips for inner tubes are skived by hand great skill is required in order to make the bevel uniform and give it the proper angle to form the best joint. A new machine for doing this work, automatically cutting and beveling several strips at one operation, is illustrated herewith.

The drawings show end and front elevations of the machine.



MACHINE FOR CUTTING AND SKIVING STRIPS FOR INNER TUBES

in which is a table *A* having a roller *B* at the front and another roller *C* at the rear, over which passes an endless belt *D* for supporting and conveying the strip of rubber under the rotating, circular cutters *E*. Each of these cutters is mounted on the lower end of a spindle in the carriage *F*, the upper end of which forms a bearing for a sleeve *G* on the splined shaft *H*.

The lower end of each carriage has a curved presser foot *I* set close to the edge of the cutter. These sleeves and carriages may be moved along the shaft and set to cut strips of any width. The cutter spindles carry bevel gears *J*, which are rotated by bevel gears *K* on the sleeves *G*. The shaft *H* is rotated by gears *L*, and the endless belt *D* is operated by a gear *M* on the shaft of the rear roller *C*. The machine is driven from the belt pulley *N* and is controlled by a clutch *O*.

The sheet of rubber is fed over the belt *D* and is held down on it by the pressure feet *I*. The cutters *E* rotate at high speed and cut the sheet into strips of the proper width and with a bevel of uniform angle. While only two cutters are shown, others may be added, according to the width of the belt *D* and the number of strips to be cut. [U. S. Patent 1,111,170, Sept. 22, 1914. E. Nall and W. C. Tyler, assignors to the Goodyear Tire & Rubber Co., Akron, Ohio.]

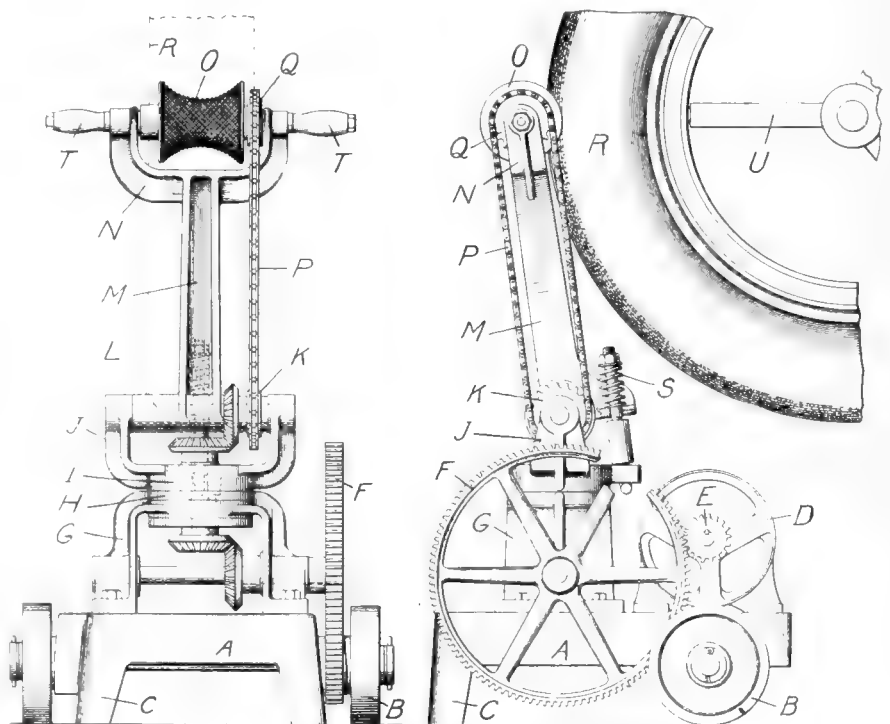
Werner & Pfleiderer Co., the well known makers of machinery for the rubber trade, are increasing their manufacturing facilities by the addition of an up-to-date foundry extension at their factory at Sarnaw, Michigan.

PORTABLE BUFFER FOR TIRES.

IN making tires with a fabric breaker strip between the layers of rubber in the tread, the under layer is usually roughened by hand with a coarse rasp to provide a better adhering surface. The accompanying drawings show two views of a portable buffer designed to do this work more quickly and effectively. The machine is mounted on a truck *A* supported at one end by wheels *B* and at the other by legs *C*. On the truck is a motor *D* whose shaft carries a pinion *E* driving a gear *F*.

The shaft of this gear is journaled in a pedestal *G* having a swivel plate *H* at its upper end. Above this is a similar plate *I* with a yoke *J*, forming bearings for a shaft which carries a sprocket *K*. This is driven through a set of miter gears from the spur gear *F*. A collar *L* on the shaft carries an arm *M* having a yoke *N* at the top. In this yoke is journaled a concave buffing roller *O* driven by a chain *P* passing over sprockets *Q* and *K*. The buffer is held against the tire *R* by a spring *S*. The yoke *N* has two handles *T* by which the arm *M* may be turned on its swivel to move the buffer from side to side over the tire, while the latter, mounted on the spider *U*, is revolving. The handles may also be used to increase the pressure of the buffer against the tire. [U. S. Patent 1,112,865, Oct. 6,

1914. W. C. Stevens, assignor to the Firestone Tire & Rubber Co., Akron, Ohio.]



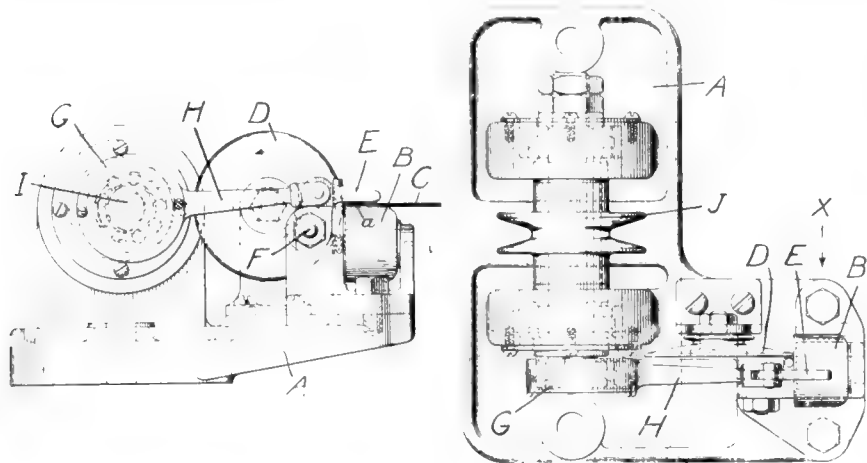
THE STEVENS PORTABLE TIRE BUFFER.

The Williams Foundry & Machine Co., of Akron, has recently received instructions from the Ford Motor Co., of Detroit, to duplicate the order previously given for fourteen Williams vulcanizing plants for as many of the Ford distributing agencies.

MACHINE FOR FOLDING EDGES OF SHEETS.

THE illustrations herewith show an end elevation and a plan of a machine for folding back the narrow strips of rubber which sometimes project beyond the edges of coated fabrics. This work has heretofore been done by hand and as the rubber is unvulcanized and of sticky character, the problem has presented some difficulties.

The machine has a bed plate *A* carrying at the front a roller *B*, over which the coated fabric *C* is moved by hand. As the fabric moves along in the direction of the arrow *X* in the plan view,



MACHINE FOR FOLDING EDGE OF RUBBER SHEETS.

the projecting edge of rubber is thrown up and back by the rapidly revolving belt driven disc *D* having a smooth edge. The folded strip of rubber then passes under a hammer *E*, which is pivoted at *F* and operated by an eccentric *G* through a connecting rod *H*, the eccentric being mounted on a ball bearing on a shaft *I* rotated by a belt pulley *J*. The hammer delivers light but rapid blows and presses the rubber strip down firmly and smoothly on the fabric. [U. S. Pat. 1,111,232, September 22, 1914. J. E. Perrault, assignor to Hood Rubber Co., Watertown, Massachusetts.]

OTHER MACHINES OF THE MONTH.

IN addition to the machinery described in some detail and illustrated above, several other appliances for use in the manufacture of rubber goods have appeared during the past month, descriptions of which, without illustration, follow.

FEEDING FABRICS TO SPREADERS.

This is a device for quickly and smoothly attaching the leader strip or apron to the fabric, eliminating the loss of time required where the ends of the two pieces are sewed together, and doing away with the wrinkles caused by the stitches. The device is a narrow metal plate as long as the width of the apron, with its front and rear edges bent over to form hooks. The rear end of the apron and the front end of the fabric are each wrapped around a narrow clamping strip, and these are slipped under the hooks on the plate. The spreading knife is then raised to allow the plate to pass under and the spreading is begun directly at the end of the fabric, so that there is no waste. [U. S. Pat. 1,110,633, September 15, 1914. C. J. Landin, assignor to Clifton Manufacturing Co., Boston, Massachusetts.]

SHOE SOLE VULCANIZER.

This is a vulcanizer for applying rubber soles to leather shoes. Unlike the ordinary dug-out or sunken mold, it consists of a base plate, engraved to form the bottom of the sole,

with adjustable and detachable walls for forming the edges. These side walls are moved in or out by set screws, so that several widths of sole may be formed for each length of shoe. By detaching the walls, others may be substituted to vulcanize soles of different thicknesses. [U. S. Pat. 1,111,436, September 22, 1914. George F. Butterfield, Cambridge, Massachusetts.]

WIRE SPIRALS FOR TIRE TREADS.

An apparatus has been devised for winding wire spirals and filling them with rubber compound for incorporation in the treads of tire casings. As the spiral is wound it is run through a tube into which the compound is forced by a feed screw. This forms a composite rubber-wire cylinder, which is cut into proper lengths and laid in the tread as the latter is built up. In the completed tire there are four of these wire spirals running longitudinally around the tread just under the surface of the rubber. [U. S. Pat. 1,111,418, September 22, 1914. F. L. O. Wadsworth, Sewickley, Pennsylvania.]

CLICKING MACHINE FOR CUTTING UPPERS.

Ordinarily, clicking presses for cutting out shoe uppers cannot be made to operate over wide stock without having the machine too large and cumbersome or making the cutting block movable. To obviate these difficulties an attachment has been designed by which, after the whole area of the cutting block has been cut over, the stock is shifted to the opposite end of a pair of supporting rails, bringing the uncut stock within the range of the cutter. [U. S. Pat. 1,113,326, September 29, 1914. C. H. Koper, assignor to Hood Rubber Co., Watertown, Massachusetts.]

BRAIDING MACHINE FOR TIRES

A machine has been patented for braiding tire carcasses in annular form, in which a braiding mechanism of ordinary construction revolves horizontally around the tire core, the latter being revolved vertically between guide rollers. When a layer of the fabric is braided entirely around the core, it is covered with a thin layer of rubber compound and a second layer of fabric is braided into it. This is repeated until the carcass is of the desired thickness, when it is slit along the inner diameter and the edges bound to prevent unraveling or turned back to form the bead. This serves as the body of the tire upon which the tread may be built in the usual way. [British Pat. 7,226 (1914). W. H. Dunkerley and T. J. Arnold, Paterson, New Jersey.]

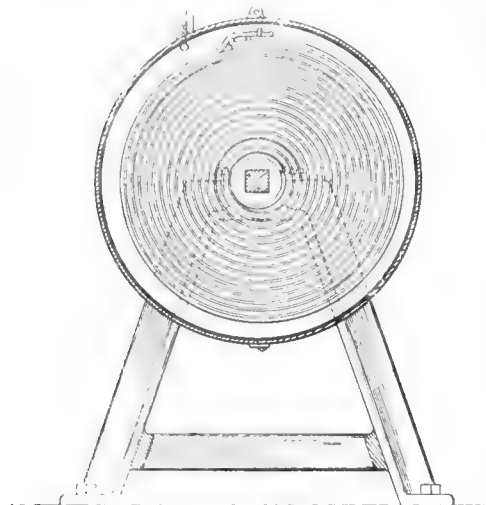
APPARATUS FOR MAKING BULBS.

This comprises two separate devices, the first for forming the bulb with one end closed and the other open in cylindrical form; the second device is for closing and finishing the bulb. The first of these has four hydraulic cylinders; two for closing the mold, one for operating the mandrel, and one for forcing the compound into the mold. After removal from the mold, the open end of the bulb is closed by placing it over another mandrel of elliptical shape, and expanding a strong rubber ring over it. As the mandrel is slowly withdrawn by a feed screw, the rubber ring contracts around the open end of the bulb and closes it. The surplus rubber is cut from the end of the bulb, which is then vulcanized. [British Pat. 7,299 (1914). Rudolf Daeschner, Pasing, near München, Germany.]

VULCANIZING RUBBER BY ELECTRICITY.

RAYMOND B. PRICE, whose name is well known in the reclaiming industry, has been granted U. S. Pat. No. 1,081,330 for a process of vulcanizing rubber in which electricity is used for developing the necessary heat, the process being specially adapted for vulcanizing such articles as belting.

The illustration shows the method used. This is a circular vulcanizer with a square bar in the center acting as a mandrel. Around this is wound the belt to be vulcanized together with a metallic strip which carries the current. Thus when the belt is wound up each side is in contact with the heating strip. The current is



ELECTRICAL VULCANIZER.

turned on through the metallic strip and it is gradually heated by the resistance.

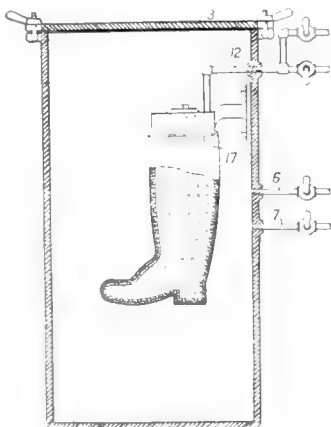
In one experiment described an electrical current of 639 amperes and 1.13 volts was passed through the metal strip for a period of 32 minutes. At the end of that time the strip was uncoiled and the belt was found to be perfectly vulcanized. The temperature rose during the vulcanization to 300 degrees F., the belt being covered with asbestos so as to give a heat insulation. The material vulcanized was a sheet of rubber packing of cheap stock, seven inches wide and 1/16 inch thick.

The claims are for the apparatus comprising the mandrel and strip of metal adapted to be coiled around the mandrel with rubber intermediate between the coils, electrical connections and a casing to retain heat.

It appears also that Mr. Price has been devoting some attention to the vulcanization of such articles as boots and shoes which are usually cured in ovens. British patent No. 10,695 of August 26, 1914, has been granted to him for a process of vulcanizing in which the article to be vulcanized—for example a boot—is placed over a perforated last or tree which in turn is connected with an air pump or some other arrangement for producing a vacuum.

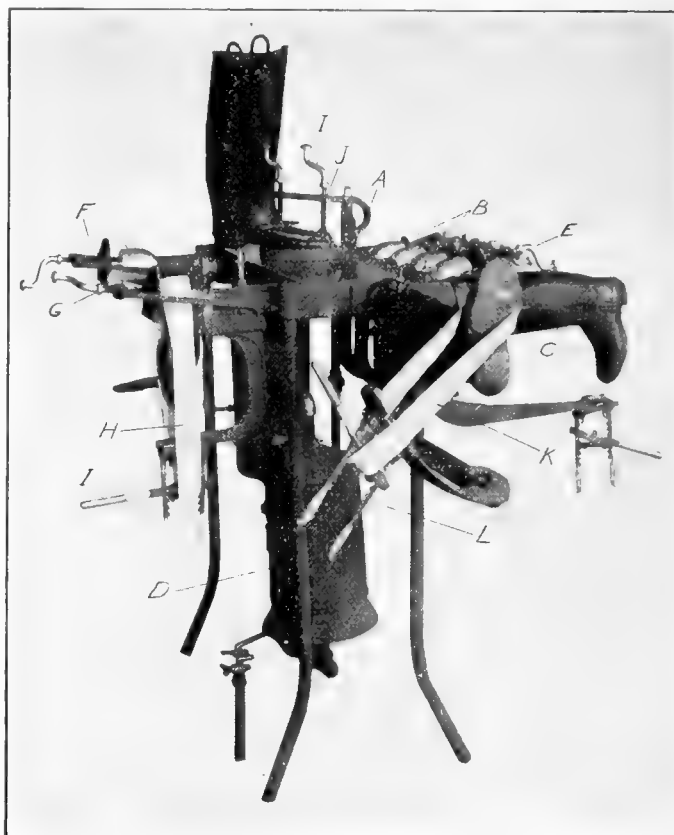
In the cut the boot is shown on the hollow and perforated last, and sealed by the wire 17 at the top. The vacuum pipe 12 serves to remove the air from the last, thus pressing the boot close to it. The effect may be heightened by putting on a pressure of air or steam through the pipes 6 and 7.

The special idea is to remove any air which may be entrapped between the fabric and rubber layers before vulcanization.



A FOOTWEAR REPAIR VULCANIZER.

THIS novel machine is constructed on the principles of the well-known tire repair vulcanizers, and is used for rubber boots and shoes. It has four tubular legs which support the steam table A, the six shoe mandrels B and the two boot mandrels C. These parts are all chambered for steam which is generated by the gas-heated boiler D. The screw clamps E hold the shoes in place while being re-heeled. If a patch is to be applied, the shoe



is placed on one of the mandrels, F, where it is held by the heel clamp, G. The patch is held in place by the presser band H and the stretcher lever I. Boots and shoes are re-soled by the sole plate J and the holding clamps I. Boots are repaired on the mandrels C and the patch is held in place by the presser band K, which is tightened by a lever L. The machine has a steam gage, water glass and safety valve. The preparation of the repair and the subsequent vulcanization is very similar to that of the tire shoe repair. [Smith & Arthur, Ashtabula, Ohio.]

FEDERATED MALAY STATES EXPORT DUTY ON RUBBER.

It is reported that the government of the Federated Malay States proposes to arrange the export duty on rubber in such a way that when the London price falls below 1s. 6d. per pound, no duty will be charged. When the price attains 2s. the present rate of 2½ per cent. would be levied.

ONE FOR THE POET.

The poet sat in the front seat as the car sped over the highway at a forty-mile clip. His hair streamed behind him as though striving to reach his hat, long since flown, but he was happy, and his soul surged with poetry.

"Where are the Ships of Tyre?" he quoted, ecstatically.

There came a sudden report from the off hind wheel.

"Punctured, b'gosh!" replied the chauffeur.—*Harper's Weekly*.

Trans-Atlantic Notes.

[The Rubber Industry's Remarkable Immunity from War Influences.]

WHEN the war broke out the rubber plantation industry of the Middle East was faced with a very difficult situation. Shipping and finance were the chief problems. It was impossible for a time to remit funds for the upkeep of estates, whilst the raising of freights and insurance risks emphasized the trouble. These difficulties were, however, soon overcome. In the Malay States the Government promptly broached a scheme for financing estates temporarily embarrassed, offering to advance 30 cents (Straits currency, equal to 16.8 cents in United States currency; 100 cents = 2s. 4d.) per pound against rubber crops and, in the case of estates not yet producing, to furnish loans on the security of title deeds. As regards shipping facilities, too, insurance rates quickly fell away as soon as practical British control of the trade route became apparent, so that in a comparatively short time practically normal conditions were resumed in the plantation industry. Supplies have been coming forward much as before, and the price of the product has continued to maintain a steady level. A number of British merchantmen have been sunk by the Germans in Eastern waters, but although something like seven million pounds of tea have gone to the bottom, no ships containing rubber in that region have yet been attacked. In the North Sea, however, one steamer conveying something like two hundred tons of rubber to Russia was mined and sunk, but that is the sum total of the commodity lost up to the middle of October. Considering Russia's pre-occupation with war that country maintained its import of rubber during September far better than other Continental countries. But all shipments have to be sent via Archangel, and as this port will shortly be closed by the ice, Russia will presumably be unable to obtain further supplies for some considerable time.

STATISTICAL POSITION IN RUBBER.

In view of the chaotic state of affairs now ruling in commercial and industrial circles, the Board of Trade figures, showing the movement of rubber to and from the United Kingdom during the month of September, are of exceptional interest. They indicate that the rubber industry has suffered far less than most through the outbreak of war. As Germany is now entirely cut off, the exports for the month naturally show a shrinkage, but, as the United States took more than usual, the total reduction is less than might have been expected. Following are the comparative exports from England for the month of September and for the nine months:

	Month ended September 30,		
	1912.	1913.	1914.
To Russia....centals of 100 lbs.	5,430	5,738	3,329
To Germany	16,028	14,078	.....
To France	18,978	7,857	1,053
To United States	25,991	35,375	51,303
Other countries	9,147	9,845	6,280
Totals	75,574	72,893	61,965

	Nine months ended Sept. 30,		
	1912.	1913.	1914.
To Russia....centals of 100 lbs.	56,383	106,644	96,309
To Germany	143,849	171,579	158,428
To France	88,214	79,325	98,304
To United States	237,881	286,670	386,576
Other countries	68,649	93,698	96,087
Totals	594,976	737,916	835,704

A heavy decline is shown in the quantity taken by France, and the export to other countries has fallen by one-third. As Belgium and Austria, both at war, are included under this head, the falling off might well have been greater.

Although the imports of rubber into the United Kingdom during September do not show anything sensational, a very pronounced shrinkage of all wild rubbers is to be noted. Whether this is entirely due to decreased production in the centers of supply is open to question, but in Africa, if not in South America, it is certain that production has been greatly curtailed. Following are the comparative import figures for September, also in centals of one hundred pounds:

	Month ended September 30,		
	1912.	1913.	1914.
From French West Africa.....	1,699	1,047	108
From Peru	3,203	2,555	277
From Brazil	22,747	14,444	11,484
From Gold Coast	606	427	169
From Straits Settlements	20,217	35,360	37,304
From Federated Malay States..	13,051	22,719	15,734
From Ceylon	9,025	15,619	24,877
From other countries	25,359	38,832	22,360
Totals	95,907	131,003	112,313

RUBBER DECLARED CONTRABAND.

At the beginning of September it became evident in London that Germany was endeavoring to obtain fresh supplies of rubber from England through Holland. Telegraphic orders were received from Amsterdam, but signed by well-known German manufacturers. At that time there was nothing to prevent the despatch of rubber to Holland, but rather than supply the enemy and contrary to their own interests, importers laid the facts before the Government, with the result that rubber was promptly declared conditional contraband. What effect this will have upon statistics remains to be seen. For the time being the consumption of rubber must depend mainly upon the demand in this country and in the United States and Canada.

THE TRADE WAR.

As your readers are doubtless aware, war to the knife is being waged in England against German trade. The Press is not merely hunting up German firms established here, but is searching the lists of shareholders of all companies filed at Somerset House to find the extent to which German capital is employed in various undertakings in England. The campaign is a very bitter one, the significance of which may not be fully appreciated in a neutral country. But it is realized here that such economic pressure as we may bring to bear upon Germany will possibly be a more potent factor in terminating the war than the military operations of the Allies in the field.

As a result of the war on German trade many Teutonic firms have been unostentatiously changing their names. It is said that as many as five hundred such changes have been made since August 1. This loophole has, however, just been effectually closed by an order in council, forbidding an alien enemy to trade under any name other than that used when the war commenced. As the order is made retrospective, the position of the five hundred is scarcely an enviable one.

The Dunlop Rubber Co., Ltd., of Birmingham, has been appointed by Royal Warrant manufacturer of motor car tires to His Majesty, The King of Spain.

The India Rubber Trade in Great Britain.

By Our Regular Correspondent.

GENERAL SITUATION ARMY AND NAVY REQUIREMENTS.

THIS has changed but slightly since I posted my last correspondence. Among additions to goods classified under conditional contraband of war is raw rubber, which, as before intimated, has been going to the enemy through the neutral country of Holland. Many of the rubber works are still exceedingly busy on army and navy orders and as early delivery is important small works which do not in normal times share in this business have come in for a share. Hundreds of thousands of ground sheets have been called for and these have been made both by the regular contractors to the War Office and also, more or less on "spec," by others who have sold them to agents. With regard to the regular contracts the inspection of the goods by the authorities is reported to be as close as ever, but so great has been the demand in connection with the new volunteer army that the ground sheets made by non-contractors, and not necessarily of the standard pattern, have found a ready sale.

The official ground sheet, I may say, has undergone some change in recent years. Formerly it consisted of a grey wigan double texture; that is the rubber was not visible. The modern form, however, is of khaki colored cloth, costing somewhere about 10 pence per square yard, and is double texture single face; that is one side is rubber surface. Every sheet, which is of rectangular form, has 36 holes near the edges. These holes are more numerous than formerly and seem to be largely in excess of requirements, as when in use very few holes are used. Their purpose, of course, is to afford facilities for lacing the sheets to the tent pegs, though it may be added that in many cases no lacing is used at all, the sheet being merely laid upon the ground to afford a waterproof base for the bed. A good deal of this khaki cloth is given out to the rubber works in the roll to be proofed. It is then made up in outside factories into knapsacks and various other articles of the soldier's kit. The cloth used for this purpose is often of a lower quality and sold at a correspondingly lower price than that for ground sheets, which, as I have already said, is 10 pence per yard for the ordinary quality, though business has been done lately at 9 pence. As there are only three firms who carry on the dyeing of khaki cloth it need hardly be said that they are working overtime.

The depression in the proofing and garment branch which has been so pronounced is now much lessened owing to large orders for mackintoshes from the War Office, both single and double textures being called for. This is an important matter for many works, especially in the Manchester district.

Leaving the army for the navy, the mechanical rubber works have a good deal on hand in connection with admiralty orders, normal requirements being largely exceeded owing to pressure of work in government and private dockyards. The most important article as regards bulk is the compound vulcanized sheet rubber, made in three qualities from specified amounts of rubber, zinc oxide and sulphur. Owing to the close competition the margin of profit on this work is by no means excessive and there is the ever-present risk of rejection should the strict letter of the specification not have been complied with. For these reasons one or two of our largest firms have held aloof from such contracts in the past. Among other goods may be mentioned gun tubes, which are 15 inches to 18 inches long, with a two-inch hole, also shaped washers with lugs for guns and plain washers perforated for both holes. Of these there are about a dozen varieties which have to be made exactly to the templates supplied. I note, according to THE INDIA RUBBER WORLD of May 1, that some revisions have been made in the United States Navy specifications owing to representations made by manufacturers,

but that the chemical tests still remain. No alterations have been made in England for many years and the chemical tests still hold good, though as no definite procedure in regard thereto has been agreed upon by buyer and seller, disagreements in results are not unknown.

RUBBER GOODS FROM THE CONTINENT.

The dislocation of the shipping trade during the initial stages of the war has largely been rectified and goods, such as Michelin tires, are again easily procurable. Russian imports, however, are still obtainable only with difficulty, while trading with the enemy is, of course, quite at a standstill. Many rubber goods appear in the category of luxuries rather than necessities, and if they become unobtainable no suffering need arise. Such an article which comes to mind is the rubber sponge, which has achieved a considerable degree of popularity in Great Britain and is one of the very few rubber goods for which we are dependent upon foreign countries. The Russian-American Rubber Co., of Petrograd, was the original maker and doubtless is still the largest producer of the best article. Despite numerous attempts to solve the mystery of manufacture, no British rubber firm has yet succeeded in making a colorable imitation of the Russian sponge, the main difficulty being the particular volatile constituent which causes the intumescence, ammonium carbonate not being satisfactory for the purpose. Others, however, have been more successful than ourselves, and sponges are now being made by one works in America and by the Hannover Gummi Kamm Co. and by another concern in Germany.

During the last decade the few British firms specializing in surgical rubber goods have had to meet a good deal of competition from abroad. Complaints as to quality have been by no means uncommon, but the purchasers have had the remedy in their own hands by buying the higher priced British goods. At the moment, of course, they are compelled to do this. As regards vulcanite, which has always come largely from the Continent, considerable progress has been made of late years in the home production of many classes of vulcanite goods, and naturally the present state of affairs has given a great fillip to this branch. It remains, however, to be seen whether the present advantage will be fully retained in the future, as the conditions for polishing goods in the workmen's homes do not obtain here as in Germany.

THE RUBBER CHEMICAL MARKET

I have read with interest the paragraph in the September issue of THE INDIA RUBBER WORLD dealing with the rubber chemical position in America. With regard to oxide of zinc, I note that America imports a good deal from Belgium. In some recent correspondence I referred to the probability of American zinc oxide coming to England. I find, however, that this has already been the case for some years, owing to an advantage in price. It is a fact that the American product is not considered quite equal to the Belgian—more commonly known in the trade as French—and it is not used for the very best work. The defect appears to be a trace of lead, which leaves black spots after vulcanization. The Belgian zinc oxide is prepared by burning the metallic zinc and is quite free from lead compounds. Presumably the position is the same in America, the Belgian oxide being imported for the best work. Whiting and chalk, in the article under notice, appear to be somewhat mixed. If the chalk referred to is produced in England it must be whiting, which is put under a separate heading. In the British rubber trade chalk always means "French chalk," silicate of magnesia, which comes mostly from Italy, while the real chalk, carbonate

of lime, is always referred to as whiting. One of the largest exporters of the latter, by the way, though a British firm, has its works situated on the French coast. It is stated that most of the magnesia used in the United States is imported from the neighborhood of the Balkans. The actual locale is the island of Euboea in Greece, but what is exported from there is the hard magnesite rock, which has to be converted into the light powdery hydrated carbonate of magnesia before it can be used in rubber manufacture. Presumably this is done in American chemical works. In British manufacture, although the Grecian magnesite is used to some extent, the more common raw material is the dolomite limestone, which occurs in bulk in certain districts and is a double carbonate of lime and magnesia.

Referring to Britain, there is a brisk demand for rubber chemicals, while prices generally are now much what they were before the war, the shortage of sulphur which was acute for a time having now been rectified.

PAVEA RUBBER.

What news there is about this so-called synthetic rubber is entirely of a negative character, and it certainly looks as if the bubble had burst. It is hinted in more than one quarter that people prominently connected with the project are not altogether surprised at the condition of affairs, but I feel certain that there are others who supported the project financially who are now much upset at the turn of events. As nothing is now being done at the large building rented at Handforth, it was proposed to utilize it as a barracks for a battalion of the newly formed Manchester City Regiment, but it has been taken over by the War Office as a camp for German military prisoners.

WILLESDEN CLOTH.

This material is now in large demand for officers camp equipment, portions of bedding, buckets, bath, etc., being made of it. No rubber enters into its composition, which consists of a stout cotton twill rendered waterproof by an organic salt of copper. It has long been used by the Post Office Department for mail bags and is always recognizable by its bright green color. I understand that the patent has now run out so that there is no monopoly in the manufacture.

DR. CARL W. THIEL.

Dr. Carl W. Thiel, who returned from Germany to Messrs. Reddaway's works at Manchester on an agreement for a term of years, went back to Hamburg at the close of the period.

RUBBER FLOORING.

The rubber flooring laid in the Stephen Ward of Guy's Hospital, London, by the Rubber Growers' Association, was presented to the hospital on October 6 by Lady French, wife of the Field Marshal at the moment so much in the limelight. Numerous invitations to the ceremony and afternoon tea were issued to rubber men and others by the president and governors of the hospital. The flooring was made and laid by the Leyland & Birmingham Rubber Co., Ltd. Mr. McEwan, chairman of the Rubber Growers' Association, in the course of a speech, said that about 170 rubber companies had contributed, also stating the association had presented 1,000 hot water bottles made of plantation rubber to the British Red Cross Society.

SILVERTOWN RUBBER WORKS EMPLOYEES AID THE ALLIES.

Voluntary subscriptions by employees of the Silvertown works of the India Rubber, Gutta Percha & Telegraph Works Co., Ltd., to a war relief fund of their own organization amounted in four weeks to £100, half of which sum was donated to the National or Prince of Wales Fund and the remaining half divided equally between the British Red Cross Society and the Belgian Relief Fund. The intention is to send similar sums, at least, to each

fund every four weeks as long as may be necessary. Since the commencement of the war about one-fifth of the male employees of the company of suitable age have left for military service.

BRITISH TRADE NEWS NOTES.

THE North British Rubber Co., Ltd., whose plant at Castle Mills, Edinburgh, is said to be the largest rubber manufacturing plant in the British Empire, is paying half wages to all married employees engaged in active war service, and to those of the unmarried men similarly engaged who have relatives dependent upon them. In addition, positions will be kept open for these employees until the close of the war.

A. Schrader's Son, Inc., of Brooklyn, engaged in the manufacture of tire valves and tire pressure gages, has opened a factory branch in London, at 14-16 Dorset place, following out arrangements made before war broke out. This branch, in charge of W. H. Cole, is expected to be in operation during the present month.

Forty-five members of the office and works staff of Messrs. David Bridge & Co., Ltd., rubber machinists, Castleton, Manchester, have joined the British colors. Weekly allowances are being made to those dependent on them.

Two of the plans for the introduction of rubber tiling in London for use as hospital flooring have been carried into effect. In both cases the plantation rubber used was donated by the Rubber Growers' Association. Stephen Ward at Guy's Hospital has been paved with rubber tiling manufactured by the Leyland & Birmingham Rubber Co., Ltd., while a second gift of flooring has been made to the Children's Hospital, Great Ormond street, London.

St. Michael's Church, Cornhill, London, has been paved with rubber tiling, which is said to have much improved the acoustic properties of the edifice.

Complaints are heard from England that the sporting goods trade is in a condition of unprecedented depression as a result of the number of customers drafted for combative purposes. Reduction of staff or suspension of production has been threatening the activity of large concerns. Men of advanced years now form the bulk of those still adhering to golf and other outdoor sports.

The contractors supplying the Birmingham Corporation have been notified that all German and Austrian goods will in future be strictly excluded from the supplies to be furnished to that body. Rubber articles for surface cars, ebonite and vulcanite for electrical purposes, asbestos and other insulating substances are among the goods thus affected, as well as a large quantity of mechanical fittings. As to rubber erasers and elastic bands, British manufacturers have for some time past taken this business from their Austrian rivals, while in the latter article there has been keen competition from America. This municipal business in the various sections of the rubber industry is of importance and merits the attention of American manufacturers.

The Avon India Rubber Co., Ltd., of Melksham, Wiltshire, is contributing toward the Prince of Wales Relief Fund 2s. for every dozen Avon golf balls sold, a sum which is said to practically absorb the profit on the sale. About 20 per cent. of the employees of this company joined the colors within a month of the declaration of war.

About 200 employees of Messrs. Charles Macintosh & Co., Limited, Manchester, have joined the ranks of the British army, relief being given their dependents by the company. Some sixty Wood-Milne hands have offered their services, special allowances being made their families, in addition to the contributions of the concern's workmen who are still employed.

International Rubber Conference.

Predominance of Papers by Rubber Chemists.

IN examining the papers read at the recent International Congress held in conjunction with this year's Rubber Exhibition in London, one is struck by the great change that has taken place since the previous Congress in the subjects chosen for discussion. Whereas, three years ago, the papers nearly all dealt with rubber in one or other of its botanical aspects, on the present occasion the chemist and the manufacturer practically monopolized the stage. The great majority of the papers were intensely technical, whilst the various debatable points were almost exclusively thrashed out by rubber chemists. In illustration of this it may be mentioned that while de Wildeman's contribution on "The Cultivation of the Rubber Vine in Central Africa" seemed to arouse hardly a vestige of interest, Helbronner's paper on "The Vulcanization of Rubber by Ultra-Violet Rays" and Schidrowitz's discourse on "Variability" met with receptions indicative of the most acute interest.

This change of ground from the field of cultivation to the realm of the chemist was duly noted by the chairman, Dr. Torrey. His remarks in this connection are worth recording. "The first paper at the last Congress," he said, "was one which led to the most active and spirited discussion I have ever heard on any paper, and at the end of the time the entire conference practically demanded that there should be more time given for the discussion. The result was that on the next day an extra two hours had to be assigned to it. And what do you suppose the subject was? Well, it was 'The Forest Growth of *Funtumia Elastica*.' If the first paper at this Congress had opened on that subject it would have cleared the room in twenty minutes. That was three years ago and I mention the incident just to show how things have moved on."

HEVEA WITHOUT A RIVAL.

Much has been learned in the meantime as to the capacity and economic value of the various latex yielding trees. In point of fact it may be said that so far as the planter is concerned, a process of elimination has been going on which has left *Hevea Brasiliensis* without a rival in the estimation of the rubber grower of the Orient. The planter of the Middle East is generally familiar with *Castilloa*, *Ceara* and *Ficus*, and after much experimenting he has discarded them all in turn as unworthy to hold a candle to *Hevea* as a plantation tree. In Java and Sumatra, some years ago, the Dutch laid out many hundreds of acres with Rambong. These trees are now being steadily cut out to give place to *Hevea* and, in some cases, *Ficus* trees have been felled by the hundred to make way for the more reliable and better yielding native of Brazil.

As to the value and treatment of various species growing wild in the African forest, with the fall in prices and the rise of the plantation industry, growers and consumers have lost all interest. Hence the papers at this conference dealt almost exclusively either with the treatment of *Hevea*, the treatment of the product, or the behavior of the same when subjected to various chemical processes.

OLD PROBLEM REVIEWED

To the non-scientific, or rather to the practical, mind, one of the most interesting papers was that by A. Irving on "A Comparison of Wild and Plantation Rubber." The author, in addition to being a planter of some experience in both Ceylon and Malaya, was recently commissioned by the Brazilian Government to visit the Amazon Valley, with a view to introducing better methods of production and to advise as to the establishment

of a plantation industry in that region. One or two points in his discourse may be referred to. The fact, for example, that trees in the Amazon are generally at least thirty years old before they can be profitably tapped—comparing with four years in the case of plantation trees—may have considerable bearing upon the relative quality of the rubber produced. Mr. Irving also remarked that he had often been asked what reserves of rubber trees there were in the Amazon Basin. His reply was that there were many millions of unworked trees in the country, but their inaccessibility rendered them an unrealizable asset with rubber at its present price.

The discussion that ensued was a very interesting one, for it revolved round the question as to whether the Eastern plantations are in reality operating with the best variety of *Hevea*. The late Dr. Huber, who made a wide tour of the plantation zone, is generally credited with the definite statement that it is the true *Hevea* that has been planted in the Orient. Mr. Irving stated, however, that he had seen as many as six different varieties growing together in Brazil and was informed by all with whom he came in contact that Wickham had not succeeded in getting the best variety of rubber seed, namely, that of the Black *Hevea*. Wickham holds a contrary view and has asserted it with ample testimony on more than one occasion. Dr. Werner Esch, who was prominent in most of the discussions, said that he had heard Dr. Huber himself state that the variety of *Hevea* found on Mid-Eastern estates was other than that recognized as the best in the Amazon Valley. He disputed the general interpretation given to Huber's words and reiterated the statement that this authority had personally told him the plantations have not got the same tree. The mystery thus becomes deeper than ever. It is, however, one that is scarcely likely to perturb the plantation industry.

PREFERENCE FOR UNSMOKED RUBBER.

Another practical paper was on the "Advantages and Defects of Plantation Rubber," by Mr. W. A. Williams, the general works superintendent of the North British Rubber Co., Ltd. He contended that the introduction of plantation rubber had been the means of displacing "mediums" to a very great extent, simply because its use in the factory had given less trouble in manufacturing operations and better results with an attendant reduction in the manufacturing cost. As a displacer of mediums, he said, plantation rubber had made a bold bid for the market and had been successful. In other respects Mr. Williams gave expression to views which are certainly unorthodox, albeit the more interesting on that account. After repeated trials he had found that unsmoked biscuits and sheet gave the best all-round results, and were to be recommended for the reasons that for strength and uniformity they were quite as good as smoked sheet and were undoubtedly superior to creped or blocked rubber. With creped rubber he was afraid the planters had sacrificed everything to appearance, the one object apparently being the turning out of a nicely finished, attractive looking product. Creping and grinding of the rubber should, in his opinion, be left entirely to the factory side and it should be the aim of planters to turn out their rubber as strong as they possibly could. In conclusion, he put in a plea for a closer working relationship between producers and consumers.

This paper gave rise to very little discussion. Here it may be observed that very few manufacturers supported the conference, presumably on the ground that such experience as

they have gained by much observation and experiment is their own peculiar property. Nevertheless, an expression of views on broad lines, such as in the foregoing paper, could hardly be detrimental to any individual interest and might conceivably be helpful to the industry as a whole.

VULCANIZATION BY ULTRA-VIOLET RAYS.

Probably the most controversial papers were those read by Bernstein and Helbronner on "The Study of Rubber Solution Vulcanized by the Ultra-Violet Rays" and the other on "Vulcanization." The two subjects were, as a matter of fact, dealt with as one paper. They provided what might be termed the sensation of the Congress. A very animated discussion ensued. The idea put forward was a new one and it brought out some very interesting remarks from Sir Wm. Ramsay. The joint authors of the paper claimed to have arrived at a solution of a problem of depolymerization and re-polymerization, but it was not claimed that it could be applied to general vulcanization. Helbronner stated that in the course of his experiments he made about one hundred analyses. It may be added that the sample which was handed round to demonstrate the effect of their solution was generally considered hardly satisfactory. In this instance the chairman had to bring the discussion to a close after expressing a hope that it might be possible to reopen it at a later stage.

PROBLEM OF THE DAY.

Another very important paper, dealing, as it did, with the question of the day, was that by Dr. Schidrowitz on "Variability," although, as the author put it, his treatment of the subject was only to be regarded as quite preliminary. One fact that came out in the ensuing discussion was of great interest. Dr. Schidrowitz, in explaining a point in connection with average results, stated that he obtained superior results from the better types of plantation rubber than from average washed samples of fine hard Pará. "Whereas," he remarked, "we frequently get a genuine index figure from plantation rubber, unwashed, of well over 1,000, the average fine sample of washed Pará becomes rather lower, the figure in this case being something like 900." In reply to a remark by Mr. W. A. Williams as to the "human element" in mixings, Dr. Schidrowitz asserted that one could, to a very large extent, get over this difficulty by using one of the new type of mechanical mixers, which eliminates handling.

MR. P. L. WORMLEY'S PAPER.

Much interest was also displayed in the paper on "Influence of Temperature on Physical Properties of Rubber," by Mr. P. L. Wormley, of the United States Bureau of Standards, and in that by Mr. D. E. Douty, of the United States Conditioning & Testing Co., on "Some American Methods of Testing Mechanical Rubber Goods." In connection with the former paper much curiosity was evinced as to the methods employed in the Bureau of Standards at Washington. The chairman remarked that the influence of temperature upon rubber was of great importance and had not hitherto received adequate attention. In reply to a question as to whether any attempt had been made to separate the effects between the greater distensibility of the rubber at high temperature and its expansion or contraction, Mr. Douty answered in the negative and added that the speed at which the rubbers were stretched was so slow that there was no danger of heating up. Dr. Esch observed that a temperature of 70 degs. in a test for elongation and tensile strength would not be practicable with mixings containing balata or gutta-percha. In reply Mr. Douty pointed out that it was not proposed to make one standard temperature for all tests, but to determine the temperature at which tests for certain goods should be carried out.

"ABNORMAL EFFLORESCENCE OF DISCOVERIES."

At an exhibition devoted almost entirely to natural rubber and its means of exploitation, and among men who had so much at stake in a like connection, it is scarcely to be wondered at that the paper on "Synthetic Rubber," by M. Gaston Chardet, should have received a somewhat frigid reception. Yet the author handled his subject cleverly and impartially and not without touches of subtle humor. "In that department of organic chemistry," he observed, "a phenomenon unique in the history of science had been witnessed, an abnormal efflorescence of discoveries and of patents launched upon the world by inventors, well meaning if not always the most capable." Chardet virtually admitted that rubber synthesis is a subject only of academic interest. He complained that in such investigations the public saw only the money result. The result was nothing—the effort was everything; and the value of the work must not be measured by its success. Synthetic rubber was not a great industrial discovery, but it would be none the less a great scientific discovery.

One may imagine that the utilitarian element was uppermost in M. Chardet's audience. Dr. Slocum, who read the paper, appeared to disapprove of it almost in its entirety. His view was that the chemist interested in synthetic rubber should devote his attention to producing a new rubber rather than in competing with the existing forms of natural rubber. He thought the production of a new gutta-percha or balata was the happiest thing for the synthetic chemist to aim at. Furthermore, he questioned the possibility of the by-products being of any real commercial utility. The whole subject was apparently regarded with so little interest by the Congress that after the few remarks of Dr. Slocum discussion entirely ceased.

A COINCIDENCE.

A paper on "Experiments in the Direct Determination of Mineral in Rubber Mixings" was described by Dr. Torrey as one of the most instructive ever provided on the subject. The authors were Messrs. B. D. Porritt and R. Wheatley, the former being the chief chemist of the North British Rubber Co., Ltd. A significant coincidence occurred in connection with this paper. Another on precisely similar lines had been volunteered by Mr. H. Williams Jones and although the authors had not conferred together in any way they arrived at conclusions practically identical.

This brief survey does not, of course, cover the whole of the papers read at the conference. Attention has merely been given to those which aroused the greatest interest and gave rise to most discussion. It is understood that the entire series will shortly be published in book form, when those who wish will be enabled to study them in detail.

ENGLISH ARMY BUSINESS IN WATERPROOF GARMENTS.

According to latest reports, the production of waterproof fabrics has not equaled the demand. One large order for garments, placed some weeks ago by the English Government, exhausted the whole available stock of heavy sateens and similar fabrics.

All stocks of heavyweight coats have been cleaned out and further orders placed for thousands more. Large government orders for motorcycle suits took off all stocks of goods for that purpose and necessitated placing further orders.

This unexpectedly large business has caused overtime work in the garment industry, the demand exceeding anything ever looked for.

SWIMMING COLLARS FOR BRITISH NAVY.

The British Admiralty has recently arranged for a supply of swimming collars to be distributed to the officers and men of the fleet, and instructions have been issued that this protective device be worn by the men when awake, and kept inflated and near each man when he is asleep.

"GALBULOSE," A NEW PROOFING.

JUST what "Galbulose" is made of the inventor, William MacIntosh, of Liverpool, England, refuses to state. He does say that it is a chemical combination of a fossil resin and cellulose. The raw product looks like sheet balata, and this, treated with a certain solvent, is spread on cloth for proofing, just as rubber is. The product, he it said, is called "Zama" cloth. Mr. MacIntosh has a factory near Liverpool, operated by the Zama Co., Ltd., and an American factory at Springside, Stamford, Connecticut. This is called the British American Manufacturing Co. He claims to have orders for army blankets, tents and ponchos from the British and French governments and to have sold some four hundred thousand yards to the United States government.

As an old rubber man, Mr. MacIntosh ought to know what the trade calls tar-in-coated rubbers. He started with the North British Rubber Co., Ltd., in 1880, and was with them for ten years. Then he went to the Harburg-Wien Co., then back to England to the Silvertown Co. After a bit he went with the Austrian American Co., then with the Continental at Hannover, then with Reithoffer in Austria, then with Klinger in Hungary. Leaving the German speaking peoples, he spent three years in the rubber shoe factory at Malmo, Sweden, after which he signed up with the International Co. at Brussels, Belgium. In 1907 he returned to England and engaged in proofing on his own account—and Galbulose is the result. At present he is making, besides army blankets and ponchos, hospital sheet, aeroplane double texture cloth, etc.

ENGLISH CONFIDENCE RESTORED.

On the declaration of war, English rubber manufacturers and dealers in rubber goods felt much alarmed at the prospects. The prompt action of the Government in taking over private cars and in purchasing liberally from manufacturers, speedily re-



1. PONCHO AS WORN WHEN CARRYING ARMS. 2. CAPE WHICH COVERS BLANKET AND EQUIPMENT WHEN MARCHING. 3. AS A GROUND SHEET OR SLEEPING POUCH. 4. SLICKER SHOWING OPENING FOR CAVALRY.

stored confidence in various important lines. These conditions have become still more favorable by the fact that the owners of the cars requisitioned have been placing orders for new vehicles, and that the war office is continuing to order motors freely.

The present war is one of motors; every conceivable form of automobile having been impressed in thousands into the service of the English and Continental armies.

ENGLISH MOTOR AND TIRE BUSINESS.

An enormous order for motor cars is said to have been secured from the Russian Government by the Austin Motor Company, which, it is understood, will indirectly benefit the Dunlop Tire Co., whose tires have been in the past largely used by the above-named company.

The Birmingham depot of Pirelli & Co., Milan, has received an important shipment of tires and cables from its Italian factory. This concern has been showing the "basket" tire, a new model, 32 x 4 inches, which has non-skid qualities but dispenses with the use of steel studs.

The accepted authority on South American rubber—"The Rubber Country of the Amazon," by Henry C. Pearson.



PONCHOS USED AS A TENT.

Rubber Notes From Germany.

SINCE the declaration of war rubber manufacturers have been in many cases very busy on government contracts. Technical articles, automobile tires and hospital supplies have been the chief features of recent production.

While these government contracts have made some concerns very busy, their importance must not be overestimated. Although intrinsically of importance, they do not make up for the lack of export trade they involve. On the whole, the rubber industry is suffering from the absence of its working force, which has in many cases necessitated operating on short time, and in some instances complete suspension.

Another source of trouble has been the fact of the government claiming the available stocks of benzine and benzole, in order to provide for the prospective requirements of military motor traction. When this claim was first made, the details of the existing stock were not known and there were well-grounded fears of a deficiency. Any such scarcity would have affected the supply of solvents for the rubber industry. Fortunately, it is now ascertained that there is a sufficient stock of these articles at the disposal of the government to provide for the requirements of motor traction and the fears of rubber manufacturers have been dispelled to such an extent that numerous plants are in operation which had been working on a reduced scale under the apprehension of a dearth of solvents. The government authorities have facilitated the execution of their own orders by permitting the use of the necessary solvents by the manufacturers for that purpose.

At an early period of the hostilities, a suggestion was made for the establishment of maximum prices for rubber, but the conclusion was reached that in view of the present difficulties attending transportation, such a course was undesirable. The principal works are said to be supplied with enough rubber for several months' consumption.

ENGLISH OPPOSITION TO GERMAN PATENTS.

A recent Paris report stated that the English government had declared all German patents and trade-marks outlawed. Further information showed that the above statement was not strictly correct. The facts were that a law enacted gave the Board of Trade authority to make regulations for the total or partial revocation, or for the temporary suspension, of patents or trade-marks for the protection of subjects of a power at war with England. The regulations issued by the Board of Trade are said to leave it to the interested parties to impugn the patents and trade-marks which protect natives of countries at war with England, or which are opposed to English interests.

For this purpose an application to the Patent Office is needed, in which the applicant has to show that he has a serious intention of operating the patent, or of marketing the goods protected by the mark, and that his application is in the public interest.

When these conditions have been fulfilled, the patent or mark attacked can be declared invalid or can be put out of force until further notice. As the fulfilment of the conditions named presents no difficulties to the interested parties, this plan is regarded in Germany as being equivalent to the abolition of protection to Germans by England.

The question of retaliation has been occupying the attention of the German government, representatives of which have been in communication with the rubber industry.

EXPORT TRADE WITH NEUTRAL COUNTRIES.

German manufacturers, while recognizing the difficulties now attending export trade with their former customers, have been giving attention to the question of conducting such trade with and through neutral countries, or with German houses in the markets

they wish to reach. They hope in this way to parry the attacks of England in her "war to the knife" commercial policy. Germany and Austria have made joint preparations for warding off the threatened danger.

From another point of view, Germany feels that she is too good a customer of various foreign nations for them to risk with indifference the loss of the German market.

CAMPAIGN REQUIREMENTS IN RUBBER GOODS.

Among the articles now being made by German manufacturers for service in the war are "Bandage Packages" intended to be carried by the soldier for his own use. They contain a sterilized strip of wadding, attached to a muslin bandage and covered with cambric. This outfit is sterilized and, according to its composition, packed in paper, waterproof fabric or similar material. It is fastened with a safety pin or with clips. Its practical value is that a soldier might bleed to death if he had not provided himself with one, or if a comrade had not this "self-bandaging" equipment. Pocket drug outfits also come under the same heading.

Inner soles of rubber and other materials are likewise worn to a considerable extent, but half soles have the disadvantage of creasing in the boot. For the special use of reservists who have exchanged a sedentary for a military life, rubber-sponge soles have been much approved as preventing the dreaded "horny skin" on the soles of the feet. Its durability renders the rubber-sponge sole particularly suitable for use in war.

Toilet bags (waterproof) form another group and are meant to carry a piece of soap, a rubber sponge, a tooth brush and other necessary articles.

Waterproof clothing has become an important item of military equipment, particularly in the form of waterproof vests of rubberized material, as a protection against being "drenched to the skin." The importance has been urged of rubber goods manufacturers retaining their hold on the trade in these articles and not letting outfitting houses take it out of their hands. For saving uniforms, mantles have been brought out which are specially adapted for that purpose, being very light and thin. Another article is the "breast bag" for carrying various articles, as well as the rubber drinking cup. Thus in many objects of general utility, in addition to medical supplies, rubber contributes to the soldiers' comfort.

THE WAR AND THE GERMAN RUBBER INDUSTRY

For three weeks after the declaration of war by Germany freight traffic was practically suspended, only the requirements of the army and navy, or those for maintenance of the railways, being transported. The removal of the prohibition improved the situation, in which improvement the mining industry largely participated. Prices for all raw materials have considerably advanced, increased rates for asbestos products, steam packing and technical rubber goods being regarded as unavoidable in the near future. Crude asbestos cannot enter Germany from its principal sources (Canada and Siberia). Each factory having to depend on its stores of the article, it is predicted that the manufacture of articles composed of rubber and asbestos will soon come to a standstill.

The whole rubber industry is reported to be stagnant, many plants being closed down. The export of balls, toys, etc., has almost completely ceased, and it is thought that imports of crude rubber will be for a long time on a reduced scale. As to coal and other raw materials than those above referred to it is understood that the rubber industry is sufficiently provided with supplies. The hands necessary for the manufacture of tires for

automobiles, motor trucks and bicycles, as well as of surgical articles, have been released by the military authorities.

Many plants in Eastern Prussia have been destroyed by the Russian invading forces. What the ultimate salvage may be it is impossible to define at present.

ADVERTISING RUBBER CLOAKS AND SHOES.

In spite of the war and the reduced purchasing capacity of the general public, German manufacturers still anticipate full demands for rubber cloaks and rubber shoes, encouraged by advertising. This year, however, German goods will be asked for in place of English cloaks and Russian shoes—the demand being well within the capacity of the German industry. Preparations were made in the early part of the year, and a scarcity of goods is therefore not anticipated. The importance has been urged of manufacturers maintaining prices for German products of standard quality, instead of diminishing the value of the goods by cut prices.

LIBERAL ACTION OF EMPLOYERS

Every effort has been made to help the families of the workers called to the front. In some cases the families of the married men are drawing full salaries, while in most cases half wages are being paid. These payments are supplemented by contributions from the factory benevolent funds and from private sources. In the case of Traun & Sons, Hamburg, the factory fund had been running 100 years. The plant of Philip Penin, Leipzig-Plagewitz, has only dismissed a few hands, and has kept in nearly full operation.

DEATH OF A VETERAN GERMAN RUBBER MANUFACTURER.

At the ripe age of 92, Privy Councillor Wilhelm Herz passed away on September 28. He had been at the head of the well-known Berlin rubber manufacturing firm, S. Herz, and his end was a surprise to his many friends, who had been witnesses of his activity up to within a fortnight of his death. His memory will long be cherished as the Nestor of the German rubber industry.

GERMAN CONTRACTS FOR FOREIGN RUBBER SHOES.

In answering a correspondent who had asked the position of contracts for St. Petersburg and Edinburgh rubber shoes, the "Gummi-Zeitung" lately wrote that all purchases and contracts in themselves remain in force notwithstanding war, but if the war renders delivery impossible, buyers and sellers are released from their obligations without having claims for compensation.

Hamburg shipping agents are advertising steamer facilities to oversea countries from Amsterdam, Rotterdam, Copenhagen, Stockholm and Göteborg. The "Hansa Alliance" has opened an office at Stettin for the guidance of manufacturers desirous of shipping through neutral Scandinavian ports.

Among the large contributors to the German war loan is the Continental Caoutchouc & Gutta Percha Co., of Hanover, which has signed for nearly \$50,000.

AUSTRIAN PROHIBITION OF RUBBER IN TRANSIT.

According to an Austrian ministerial ordinance of September 11, india rubber, gutta percha, balata (crude or purified, as well as waste from those substances, and also rubber substitutes) are included among the articles of which the export and transportation are prohibited.

"SEMPERIT" WORKS PROVIDING FOR FAMILIES OF WORKMEN CALLED TO WAR.

The "Semperit" Austro-American Rubber Works, of Vienna, is paying full salaries to the families of married workers called to war, and to the representatives of unmarried workers a long time in its service, while those of the workers who have been a short time in its employment will draw half salaries.

GERMAN RUBBER MEN SUPPOSED PRISONERS OF WAR.

At the opening of the campaign, Messrs. Clar and Tenz, natives of Germany, section managers at the Colonial rubber plant in Ghent, were taken prisoners. Not having been heard from since, their friends are becoming anxious regarding them.

MINERAL LUBRICANTS SCARCE.

The reduction of imports, in conjunction with the fact that the government has taken possession of the stocks of lubricants, has produced serious trouble. Prices have considerably advanced, which is to the benefit of firms holding stocks. Imports of Russian oils have entirely ceased, which renders it necessary to have recourse to the more extensive use of American oils, in some cases mixed with vegetable oils. The oil business is the most active in the technical branch, while rubber and asbestos are relatively quiet.

AN EDITOR BECOMES A LIEUTENANT.

Dr. Karl Gottlob, chemist of the Farbenfabriken, formerly Friedr. Bayer & Co., Elberfeld, is an Austrian infantry lieutenant in the present campaign. Dr. Gottlob is well known to the rubber industry as the editor of the "Gummi-Kalender."

ENGLISH RUBBER IMPORTS (IN TONS) FOR MONTH OF SEPTEMBER.

From—	1912.	1913.	1914.
Straits Settlements	915	1,600	1,700
Federated Malay States	600	1,000	715
Ceylon	410	709	1,130
French West Africa	77	47	5
Gold Coast	27	19	8
Brazil	1,034	657	522
Peru	145	116	13
Other countries	1,150	1,765	1,016

Total, September 4,358 5,913 5,109

Total for eight months to the end

of August 34,805 46,421 44,427

Above figures are those of the English Board of Trade for the month of September for the last three years, and show the falling off in wild rubber, as well as the gain in plantation grades.

RAINCOATS IN THE ENGLISH ARMY.

There is vastly more fight in a dry soldier than there is in a wet one, or at least in one who has been very wet for a

long time. Here are illustrations showing weatherproof garments which are made both for the British infantry and cavalry. The first cut shows the service dress in which the wearer, while unencumbered by a long coat, is still thoroughly protected from inclement weather. The other cut shows a long raincoat coming well below the knees, being full in the shoulders and sleeves and having an ample width of skirt so as not to impede the wearer's movements. [Burberrys, Haymarket, London.]



FRENCH OPINION OF VALIDITY OF CONTRACTS.

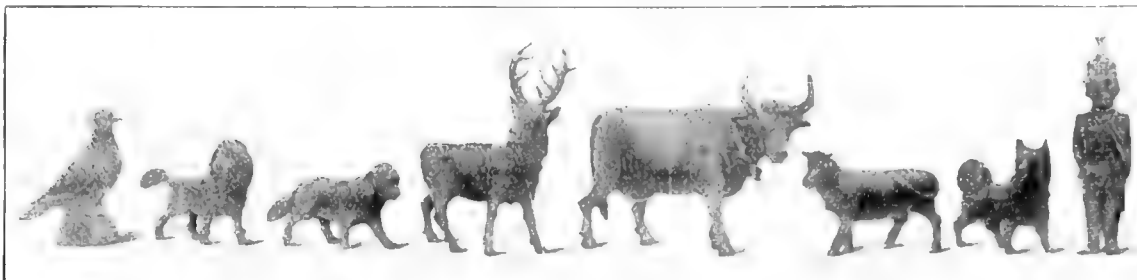
The Chamber of Commerce of Toulouse has officially pronounced the opinion that war does not in itself annul contracts; only doing so in the event of business being brought to a stop. Such is the general view of the French Chambers of Commerce, founded on the opinions expressed by jurists after the war of 1870.

German Rubber Toys.

WITH the practical cessation of the German export of manufactured products of almost every name and nature, comes the call, the world over, for the substitution of the same goods of other makes.

At this time of the year none are more clamorously sought than toys. What a rubber industry Germany had built up of toys of all kinds, the whole world knows. The total yearly exports in toys and games, as given by a British compilation of statistics, amounted roughly to \$7,017,201. This, of course, means toys of all kinds, but among them rubber

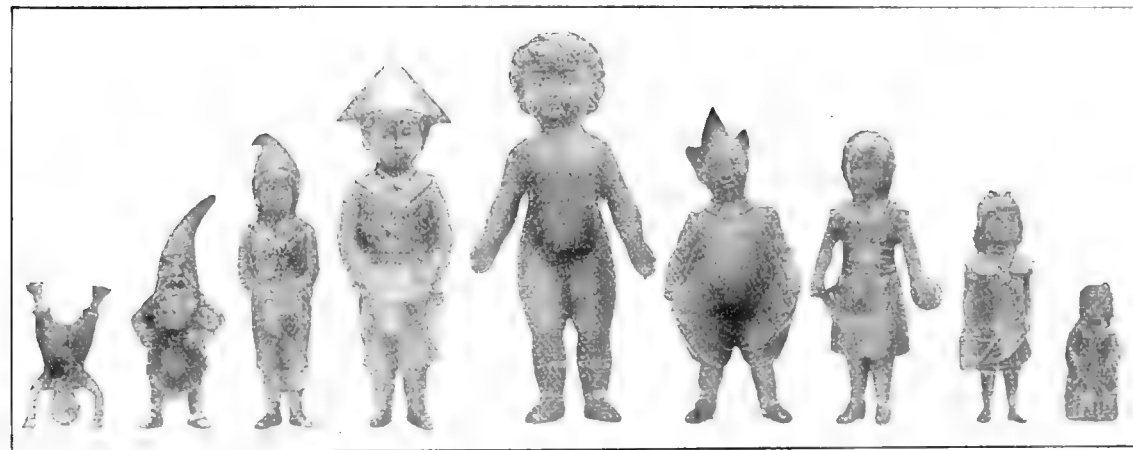
got to be very expert in turning them out. The molds as a rule were of soft metal and made in one of the factory departments. A special type of mold, it is said, was made for certain of these goods out of soapstone. This of course was a matter of hand



engraving and difficult. Certain artisans, however, expert in all kinds of engraving, did wonderful work and that very cheaply.

Soapstone molds have to be used with care and are only fitted for goods that do not require cooling. The stone keeps its heat a long time and gives an even, gentle heat.

These toys were made up in plain white, or red, and oftentimes in white rubber, gorgeously painted. They were all artistic conceptions, artistic even in their grotesqueness, and were cre-



toys were produced in greater quantity than anywhere else in the world.

In a great many of the German factories immense departments were devoted to the production of rubber toys alone. One factory whose toy molds ran into tens of thousands possessed different types for over 500 varieties in ordinary use. These embraced for complete dolls 100 patterns; dolls' heads, 20 patterns; animals, 100; birds, 26; soldiers, 50; reptiles, 10, and combinations — soldiers and riders — and novelties, many hundreds.

These rubber toys were very largely made by hand and where popular types continued year in and year out certain workers

ated to appeal to children in all parts of the world.

From the hundreds of types a few typical illustrations serve



to prove the excellence of the German rubber toys, an excellence it will be difficult for any manufacturer to equal at short notice.

JAPANESE INDUSTRY AND THE EUROPEAN WAR.

By Our Regular Correspondent.

GOING back some 20 years the development of the Japanese rubber industry is shown by a comparison between the imports of the crude article at different periods:

	Pounds.	Value.	Period.
1894.....	36,100	\$12,888	China-Japan War.
1895.....	27,553	11,556	
1904.....	485,284	284,327	Russo-Japanese War.
1905.....	733,836	422,975	
1912.....	2,004,030	1,514,557	
1913.....	2,681,943	1,725,922	

A similar, though not proportional, development took place during the period named in the Japanese imports of rubber manufactures: 1894, \$94,593; 1895, \$153,375; 1904, \$796,599; 1905, \$1,742,221; 1912, \$5,275,815; 1913, \$4,043,469.

While it may thus be seen that the previous wars in which Japan was engaged were apparently of benefit to the rubber goods import trade of that country, such is not likely to be the case with the present hostilities. On the earlier occasions, the contests were only between two countries, without serious injury to steamship lines and foreign trade, while the present war affects European, Asiatic and other commerce, particularly that of Germany with those markets. The consequent disturbance of trading relations has led to advances in the Japanese prices of crude rubber, compounding ingredients and accessories.

CRUDE RUBBER.

On the outbreak of the war plantation biscuit rubber advanced in Japan from 1 yen (50 cents) to yen 1.60 (80 cents) per pound. At time of writing it had declined to yen 1.30 (65 cents). As to the future course of the market the opinions of consumers are divided. Some consider that within a few months a good deal of crude rubber will be imported to Japan. Hence manufacturers holding these views are not disposed to increase their stocks at present prices. Others, on the contrary, see prospects of values being maintained, not recognizing the likelihood of large early imports. Rubber traders are selling or keeping their stocks according to their opinions as to the future course of the market.

COMPOUNDING INGREDIENTS.

A marked advance has taken place in compounding ingredients for the rubber industry. Glycerine has risen 400 per cent.; lithopone 250 per cent. Colors have likewise advanced, 80 per cent. of the supply coming from Germany. Dealers are indisposed to handle German colors in view of the uncertainty of receiving them in case the war is protracted. Japanese manufacturers have been making some ingredients, but have been advancing prices. The zinc white made by the Nipon Paint Manufacturing Co., of Tokio, has risen from yen 11.50 (\$5.75) to yen 16.50 (\$8.25) per 100 pounds, being made from high-priced imported zinc. Magnesia has likewise gone up. Some ingredients have been notably scarce, such as litharge, of which the Naval Department bought up many tons at the opening of the war.

SCRAP RUBBER AND ACCESSORIES.

Activity is not looked for in the Japanese scrap rubber market, which has so far been dull this year. The principal imports come from Shanghai, and any disturbance of steamer communication with that port would be reflected in the Japanese market.

Coal, oil, cotton cloths and metals have generally advanced from 10 to 50 per cent.

POLICY OF JAPANESE MANUFACTURERS.

Efforts made to establish a combination of important manufacturers have proved void of result. A conference recently took place between seven representatives of the four largest Tokio rubber manufacturers: Mitatsuchi Rubber Manufacturing Co., Meiji Rubber Works, Nipon Rubber Co., Limited,

and Toyo Rubber Co., Limited, with a view to a general advance in prices. The combine was, however, not formed, in view of the fear being entertained of competition from outside manufacturers. It was further apprehended by the makers present that by putting up prices they might lose their agents or their customers. Confidence was, moreover, expressed in being able to produce goods at lower prices, to meet competition.

The Japanese authorities are urging the use of domestic made goods instead of imported merchandise, thus adopting the policy being carried out by England. Various patriotic associations are working for the same end, particularly as to bicycle tires.

In 1913 the total Japanese imports of rubber manufactures were \$4,043,469, of which Germany supplied \$1,231,774 and Austria-Hungary \$3,525. Germany supplied crude rubber to the extent of \$18,000.

It is anticipated that the result of the war will possibly be to decrease Japanese imports of rubber manufactures and to increase those of crude rubber. Japanese manufacturers foresee an important development of export trade. The last-named branch of commerce already includes rubber clothing, insulated electric wire, rubber balls and rubber toy balloons.

PRIZES AT THE RECENT TOKIO "TAISHO" EXHIBITION.

The awards at the recent Tokio Taisho exhibition included the following: HONORABLE GREAT MEDAL—Mitatsuchi Rubber Manufacturing Co., Tokio; Yokohama Electric Wire Works, Limited, Yokohama.

GOLD MEDAL—Fujikura Electric Wire Co., Limited, Tokio; Meiji Rubber Works, Tokio; B. F. Goodrich Co., Akron, U. S. A.

SILVER MEDAL—Dunlop Rubber Co. (Far East) Limited, Kobe; Toyo Rubber Co., Limited, Tokio; Nipon Rubber Co., Limited, Tokio; Fujikura Electric Wire & Rubber Co., Tokio; Kakuichi Rubber Co., Osaka.

THE RUBBER INDUSTRY IN THE FEDERATED MALAY STATES.

From the Interesting Report of the Director of Agriculture.

LAST year the Federated Malay States produced 23,719 tons of plantation rubber, against 15,506 tons in 1912. This is just over one-half the world's supply which has been computed at 47,000 tons for 1913. The total estate production of Malaya, however, is returned at 28,214 tons, an increase of 9,266 tons over the previous year. The largest increase outside the Federated Malay States comes from Malacca, where the production was doubled during the year, and that Settlement now follows Selangor and Perak in production.

Selangor exported 11,883 tons, Perak 7,659, Negri Sembilan 3,995 and Pahang 182.

It is stated in the report of Mr. L. Lewton-Brain, Director of Agriculture, Federated Malay States, that the area newly planted in 1913 was only 34,127 acres, compared with 54,105 acres in 1912; 107,200 acres in 1911, and 48,821 in 1910. The increase is larger than might have been expected, however, in view of the fall in the price of rubber, and shows that some investors recognize the real soundness of the industry. Selangor maintained the position of having the largest rubber acreage, nearly 195,000 acres, compared with 142,000 in Perak and 96,000 in Negri Sembilan.

The rubber acreage producing in the Federated Malay States is returned at 164,390 acres, an increase of about 28,000 acres over the preceding year. The average yield per acre works out at 275 pounds, and when it is considered that about one-fifth of the whole bearing area has been taken in during the past two years, it will be granted that an estimate of 400 pounds per acre from rubber in full bearing is not too optimistic.

The fall in price, although its rapidity was unfortunate, has not been without its good effects on the plantation industry.

Estates throughout the country have overhauled their expenditures, which had, perhaps, got rather out of hand during the continuance of high prices, and many economies have been effected in all directions.

WILD VERSUS PLANTATION RUBBER.

Inferior grades of wild rubbers, it is expected, will no longer be able to compete with the cleaner and better plantation product, and with an increasing consumption of rubber, even only on past lines, the virtual disappearance of inferior wild grades should steady the market for the cultivated product. The full effect of this, of course, cannot be seen at once, as stocks of these grades had to be disposed of even at unremunerative prices. If manufacturers can expect a steady market at about present prices, there is little doubt that fresh uses will be found for rubber, and thus the increasing supplies of the plantation product coming forward during the next few years will be absorbed.

The estates that suffered worst from the rapidity of the fall in price are those which had only a part of their acreage in bearing and had calculated to use the profits on this to carry the younger areas on to the producing stage. With profits falling off as they did, it was impossible to carry out the original program, and at the same time the issue of fresh capital was rendered very difficult. It was no longer profitable even to tap some 4-5 year old areas which had been counted on to yield a fair profit at 3s. (72.98 cents) per pound. The Planters' Loan Fund of the Federated Malay States Government has been of great assistance to many estates in this predicament, and the capital of the fund was increased by a further \$1,000,000 during the year, but this new capital was available only for private owners and syndicates and local companies.

A WORD OF ADVICE.

It may now be assumed that rubber can be produced f. o. b. by many estates at 1s. (24.33 cents) per pound. Estates with large areas of older rubber and those favorably situated can produce for less than this; but it is not suggested that the majority of the estates will be able to produce at this price for some years.

The increase in the yields from trees as they mature and the reduction in the number of trees per acre by thinning out will insure automatically a steady drop in the cost of production on younger estates. This should be increased by a careful and sound economy, but Mr. Lewton-Brain points out that everything that reduces expenditure is not necessarily economy. In particular, to cut down supervision beyond the point of efficiency is no more true economy than it would be to reduce expenditure on weeding to such a point that the trees become smothered in lalang. Economy in manufacture also seems to him to be carried out on wrong lines; small buildings are often put up when an estate is coming into bearing, which must obviously be scrapped in a year or two, and all work is done by hand. Provided that money is available, it would seem sounder economy to plan from the first for the future requirements of the estate.

CULTIVATION.

In his report Mr. Lewton-Brain makes some important remarks on cultivation and the preparation of rubber for export based upon experiments carried out by various members of the scientific staff of the Federated Malay States Department of Agriculture.

Wider planting is advocated for more rapid growth of trees and more substantial yield. The general view now is that not more than 100 trees should be planted originally to the acre and that eventually about 40 or 50 to the acre should be left. A number of influential planters even favor planting originally not more than 50 trees to the acre. The change that has occurred since a few years ago, when 180 to 200 trees were usu-

ally planted, and when 100 trees was regarded as the proper and ideal number to work to, is quite remarkable.

Catch-crops are still in little favor and no planter will adopt this form of cultivation if he can avoid it. Indigo has not proved a success, but with wider spacing between the rubber trees there are possibilities for coffee cultivation as a remunerative crop.

Cover crops that are not revenue producing are also little in favor among Federated Malay States planters, though a tendency to use them on steeper hillsides is noticed. Mr. Lewton-Brain enumerates certain advantages to be derived from good cover crops, however, and he also deals with manurial experiments and methods of tapping, and mentions that cultivation of soil as distinguished from the standard clean-weeding is being adopted on a good many estates. In this latter connection he states that an interesting series of experiments has been started at Castleton Estate, Telok Anson (belonging to the department) to test the cost and effects of different systems of cultivation on this type of soil, combined with tests of cover-crops. Experiments in the use of dynamite for cultivation have also been made at Kuala Lumpur and at Castleton, and assistance has been given to a number of estates which were also experimenting.

In regard to tapping Mr. Lewton-Brain says it is clear that if the cost of production per pound of rubber is alone to be considered, the manager will undoubtedly select the alternate day system; incidentally, he will, of course, postpone tapping his trees at all as long as possible. He emphasizes the fact that it is not the profit per pound of rubber produced that alone should be considered, but the profit made per acre, and too much insistence on the reduction in cost per pound of rubber produced is therefore dangerous.

EXPERIMENTS IN MANUFACTURE.

There has probably been more discussion and writing about the subject of plantation rubber manufacture than during any period since the beginning of the industry. The steadily falling price of the plantation product and the disparity in price between this and the hard Para brought forward innumerable suggestions and theories to explain the supposed inferiority of the plantation product. What manufacturers do complain of, as regards plantation rubber, is not that it is not good, but that it is not uniform in the qualities on which they depend in the manufactured article. Each lot has to be treated differently, otherwise the final product is not of the same quality.

Having stated the problem, Mr. Lewton-Brain sets himself to deal with the solution, and sets forth the experiences of the experimental vulcanizing and testing station established by the Federated Malay States government at Kuala Lumpur. It is one of the most complete in existence. The problem of the variability of plantation rubber is an extremely complicated one, much more so than appears at first sight, and it will probably be years before the full value of the work to be undertaken can be realized. It is at any rate satisfactory to record that the first step has been taken and that real work on the fundamental problem of rubber manufacture has been started. Generally speaking, much more care is being taken on the larger and better equipped plantations to keep their methods and products as uniform as possible, but it is regrettable, he writes, that methods on so many estates are still so haphazard.

The experiments carried out dealt with smoking, drying, dilution of latex, coagulation, fungus "spots," tackiness, etc., and in conclusion Mr. Lewton-Brain deals with insect and other pests of the rubber tree and fungus diseases.

People interested financially in the plantation rubber industry will doubtless be gratified to learn that additions have been made to the staff of the agricultural department and that the Government of the Federated Malay States is doing so much to safeguard the interests of rubber growing, which has become the chief agricultural industry of the country.

Some Rubber Planting Notes.

STATISTICAL POSITION OF RUBBER.

COMING at such a late period of the year, the meeting of Harrisons & Crosfield, Limited, held in London on October 13, was of special interest. As it will be recalled, this company acts as secretary for a number of plantations, and is thus in closer touch with market conditions than any individual estate would be.

In addressing the meeting, Mr. C. Heath Clark, the chairman, remarked that last year the world's production of rubber was 117,000 tons, while consumption represented a slightly larger quantity. The present war conditions render it almost impossible to forecast correctly the rubber market. Two large consumers, Germany and Austria, have been cut off from supplies. It therefore remains to be seen how far the other European countries, together with America, will utilize the whole of the world's production.

Existing conditions he regarded as distinctly favorable. The English stocks, which had been at the end of July 5,543 tons, had fallen by the end of September to 5,416 tons, as compared with 5,859 tons in stock a year ago. Dealing with plantation rubber alone, he adverted to the fact that the total quantity landed in England during the first nine months of the current year had been 30,801 tons, against which there had been deliveries of 30,425 tons, practically the total quantity received having thus gone into consumption.

Since the commencement of the war demand has proved quite satisfactory, prices having been well maintained. A certain falling off in some branches of consumption may have taken place (such as motor cars for pleasure purposes), but there will be an increased demand for motor vehicles to do the work of the world and replace the horses withdrawn for military purposes. Prices during the current year have, on the whole, been maintained better than was anticipated, first grade plantation rubber being somewhat higher in September than it was a year ago.

A feature of importance to the rubber industry has been the reduction in costs, an average saving in the "all-in" (or inclusive) price of 6d. per pound having been effected in some ten cases investigated. This reduction he expected to continue, and to be further developed under the strict economy now being exercised in the management of estates by reason of the war. The same cause may probably lead to a reduced production. All needless capital expenditure will cease, and tapping will be avoided until the trees can show a profit.

He anticipated that the collection of wild rubber would continue to show a decrease, the falling off being attributed to difficulties of financing rather than to low prices. Figures show that the rubber exports to England from sources other than the Far East were, during the first nine months of the current year, nearly one-third less than during the corresponding period of last year.

In conclusion, Mr. Clark expressed the opinion that there would be a continued further decrease in supplies from the sources competing with the Far East, adding that whatever might be the temporary effects of the war on the rubber industry, it would still give handsome returns on the capital invested.

SUNGKAI-CHUMOR ESTATES, LIMITED (FEDERATED MALAY STATES).

By the directors' report, presented at the eighth annual meeting of the above company, on October 7, the total area is 1693.8 acres, of which 1469.5 acres are under rubber. The total quantity collected for the year was 347,621 pounds, against a yield for the previous annual period of 279,354 pounds. A quantity of 355,000 pounds is estimated for the year ending June 30, 1915.

The gross price realized was 2s. 3.25d. (55.24 cents) per pound, while the inclusive cost was 1s. 3.71d. (31.9 cents), as com-

pared with 1s. 9.76d. (44.1 cents) for the previous year. For the year ending June 30, 1914, the dividend amounted to 30 per cent.

SECRETS OF PLANTATION SUCCESSES.

The four following axioms have been laid down for the guidance of plantation companies: 1. Close the capital account as soon as possible, so as not to annihilate the progress of the enterprise by an accumulation of financial charges. 2. During the earlier years take all expenses from revenue, without yielding to the temptation of the premature distribution of dividends. 3. Do not increase the planted area beyond the limits allowed by the treasury. In other words, no loans based on the alleged necessity of extending the plantation. 4. Maintain a very capable administrative staff, constantly looking out for economies which might be carried into effect.

HEVEA IN COCHIN CHINA.

A recent number of the Annals of the Rubber Planters of Indo China contains a protest against a statement that the climate of Indo China is relatively too dry for *Hevea*. It is claimed that within the suitable degrees of latitude *Hevea* flourishes admirably. The dry season of four months in no way impairs its growth, while it serves as a protection against the diseases with which Malaya has to contend. As to the output, the yield for 1913 exceeded 4½ pounds of rubber per tree for trees with an average age of 12 years.

"PINK DISEASE" ON MALAYAN RUBBER PLANTATIONS.

In recently addressing the Central Perak Planters' Association Mr. F. J. Brooks, Government Mycologist of the Federated Malay States, expressed the opinion that "Pink Disease" was the most serious of the affections to which rubber trees are subject. The disease was first noticed in 1904, but its spread has been particularly remarked during the last 18 months.

At present it is chiefly found in southern Perak, its ravages extending to northern Selangor. It has likewise been observed in northern Perak, Negri Sembilan and Telok Anson, spreading after heavy rainfall and in thickly planted sections. The disease is caused by a fungus, which attacks every part of the tree above the ground with the exception at first of the leaves. When it has penetrated the bark it extends upward and downward and produces decomposition, the leaves and the affected branches commencing to decay and perish. The disease is most noticeable with trees from 3 to 10 or 15 years of age.

The best means of coping with the "Pink Disease," in Mr. Brooks' opinion, is the system of "Disease Brigades." This is carried out by a sufficient number of men being detailed to go over the whole plantation every three or four weeks so as to deal with the rubber trees and other vegetation affected.

In conclusion, Mr. Brooks expressed the opinion that planters should not be discouraged by the "Pink Disease," as plantation rubber is one of the healthiest of the cultures at present flourishing in the Malayan Peninsula.

ADDITIONAL CUSTOMS DUTIES IN PORTUGUESE ANGOLA.

By a law passed on July 22 last, the following additional customs duties have been levied to defray the cost of public works in the Portuguese Province of Angola:

On all exports from the Province, 1 per cent. ad valorem.

On rubber exported from the Province, 3 per cent. ad valorem.

On all products (except wines from Portugal or Portuguese colonies) imported through ports outside the Conventional Basin of the Kongo, 2 per cent. of the import duties.

Provision is made for the reduction or suspension of the export tax on rubber, according to the price of rubber in European markets.

THE WAR AND THE RUBBER AND BALATA INDUSTRIES OF DUTCH GUIANA.

By Our Regular Correspondent.

IN the September number of THE INDIA RUBBER WORLD mention was made of a company being formed in Paris for the purpose of operating certain wild rubber tracts situated in the Para district, Dutch Guiana. The capital subscribed was francs 5,000,000, or \$1,000,000, which would have paid the owners of the lands and left a considerable working capital.

Every arrangement was made for beginning operations, an expert was sent out to Dutch Guiana to examine and take over the concessions, when, all of a sudden, the accursed European war broke out, and a sudden stop to the whole business was the consequence. These concessions are again in the market, and this time, we understand, can be had for considerably less than the amount subscribed by the French concern. We have been informed on good authority that no reasonable offer will be refused by the proprietors of these lands. This is undoubtedly an opportunity for American capitalists on the lookout for good bargains.

The war has had a very bad effect on local industries, and the balata industry has especially fallen a victim to the consequences of this terrible conflict. The entire community, with very few exceptions, is suffering for want of employment and the means of earning a living. The balata industry alone employed about 5,000 men continuously, and now that the business is stopped, they and their families are thrown on the streets to beg for bread.

How long this state of affairs may last is hard to say, but we understand the government has decided to open up some sort of relief work whereby the natives, at least, may earn a little money. A great many British subjects have been granted free passage by the government, and have returned to British Guiana,

of balata which cannot be shipped away. In the end many bleeders have also thousands of pounds stowed away. To bring it into town would be useless; it cannot be sold, not even at 25 American cents per pound. The large companies, with head offices in Holland, cannot obtain money to finance their enterprises; dissatisfaction prevails, and a general smash-up stares the balata industry in the face. Although Dutch Guiana is situated thousands of miles away from the seat of war, the distress and stagnation of business is most alarming.

We predicted in previous correspondence that 1914 would be a record production year, and, although unforeseen circumstances have since taken place, the production from January to August 31 reached 600,000 kilograms. At the outbreak of the war the production for the year stood at 482,363 kilograms, when the season was at its height. All operations have been suddenly stopped, and the bleeders taken off the grants. Had circumstances been normal our prediction would certainly have been fulfilled. It was anticipated in balata circles at Paramaribo that the United States market would have taken the bulk of the production. Owing to the European ports being closed the prices quoted in New York were so ridiculously low that the exportation of all balata was naturally checked, and in consequence the markets of Dutch Guiana are overstocked with the product. We think American manufacturers would do well to try the Surinam product at this time; we are convinced good bargains are easily obtained, especially when ready cash is in such great demand in the colony.

The new regulation governing the industry passed its final reading in the local parliament, and is now law. It certainly is most unfortunate that just as these new laws came into force the European war should break out and the whole business be shelved for an indefinite period. There is no capital to invest in large tracts, and cessation is the order of the day on all balata undertakings.

Enterprising Americans can now buy all the balata they require, and pile it up against the advent of high prices. With a fair amount of ready cash on hand several hundred tons of sheet could be purchased at ridiculously low figures.

BRAZILIAN NOTES.

At a recent session of the Brazilian Chamber of Deputies, a credit of \$100,000 was voted for the preliminary surveys connected with the Santa Catharina Railway. The sum of \$450,000 was likewise approved for the removal of obstructions from the rivers Acaqui, Guapy and Guasimbola.

Brazilian imports for the first half of 1913 equaled \$205,419,960, while those for the corresponding period of this year only represented \$134,385,085.

Export statistics for the same period of the two years showed, respectively, the equivalents of \$158,038,030 and \$153,873,190.

The Brazilian press calls attention to the balance of international trade being in favor of Brazil, for the first six months of 1914.

Following up previous announcements, De Lagotellerie & Co. have given notice of the temporary closing of their Para office, as a result of the European complications. They request that all communications be addressed to Caixa Postal, 31a Manaus.

The British consul at Rio was lately advised by cable that his Government had sent three warships to the Gulf of Mexico for the protection of cotton and kerosene cargoes.

In consequence of changes in administration, twenty-two members of the staff of the Madeira-Mamoré Railway lately returned to the United States.

Brazilian statistics show the rubber exports for the first half of 1914 to have represented 66,225,308 paper milreis (\$22,075,102), as compared with 99,977,497 milreis (\$33,325,832) for the corresponding period of 1913.



IN THE FOREST AMONG THE BALATA TREES, SURINAM.

where conditions are said to be better. Great fear is entertained that should the war last very much longer the balata industry will be entirely ruined. The warehouses of the various concessionaries in Paramaribo are stocked with thousands of pounds

A New Form of Testing Device for Rubber.

IN 1912 the French Society for Encouragement of the National Industry of France entered on MM. C. Cheveneau and E. Heim a gold medal for the invention of a registering dynamometer for testing rubber samples.

This machine, as can be seen by the illustration No. 1, shown herewith, resembles the Schopper machine very closely, but has a self-registering device, P, attached to the arm which carries the weight that swings on a fulcrum, O. By means of a gear at O' the cylinder revolves as the weight is raised. By means of the rack and pinion V, which revolves a smaller pinion connected with the chain beside the cylinder, and which chain carries a pencil, a line is registered on the cylinder. The height of the line

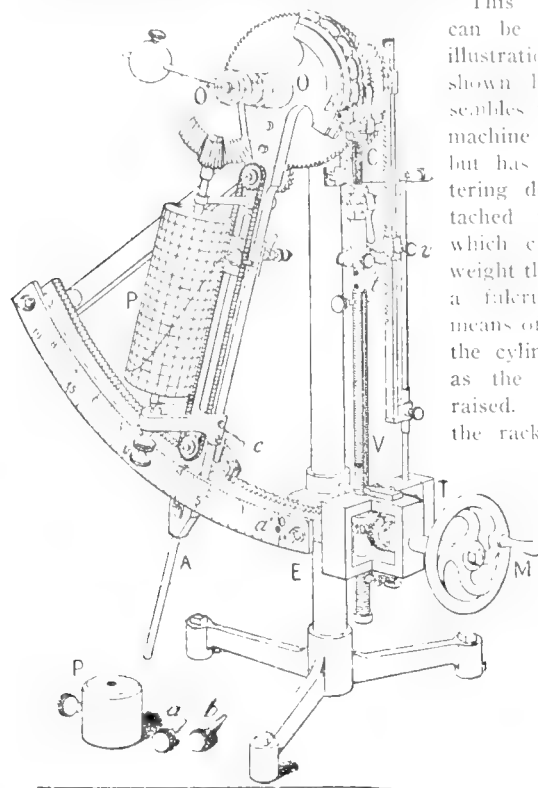


FIG. No. 1.

represents the stretch, and the distance of revolution shows the weight or pull.

A great amount of complicated calculation has been given to show the correctness of the registration. This is characteristic of many continental scientists, who would rather make a complicated calculation than a simple trial which would give a calibration, allowing for the numerous errors of the calculation and compensating for any friction or weight of the cylinder or moving machinery.

At the International Rubber Congress held in London in 1911, MM. Cheveneau and Heim gave an elaborate set of tables of the tests made on this machine, but did not describe the machine. It has not hitherto been illustrated, though it appears to have merit. A criticism of the machine and of its system of operating has since appeared in France (*Le Caoutchouc et la Gutta Percha*; July 15, 1914, page 8430), in which exception is taken to the formulas and method of calculation. The anonymous author suggests that instead of the foregoing apparatus, one be used which is shown diagrammatically in figure No. 2.

Here it will be seen that the pendulum P swings on the center o, around which a cord extends to the sample a held between the nippers. Attached to the nippers or holders are two pulleys around which a cord is stretched attached to base at one end at f, passing over pulleys at top and around wheel on end of registering cylinder and finally ending in weight g. Now as the specimen stretches in the jaws it is evident that the weight g must rise to twice the extent of the stretching of the sample. The movement of the sample a caused by the swing of pendulum or

weight P will not have any effect on the length of this cord which revolves the cylinder. Nor does the weight of g or friction of pulleys have any influence, as this pull is transferred to the weight g through the grips on the sample a.

The recording pen is moved by the bar d, connected with plate c, which follows out the extended end of pendulum at b, thus following the movements of the weight and recording it. The weight c pulls the pencil out through a rack and pinion on the bar d and the weight pulley. It appears that the pencil might be moved by simple attachment of cord from it to wheel on center o, or attached to ball c with the same effect. A simpler way would be to have the recording cylinder attached to center o and revolving with it. It would be easy to so rearrange the cord between f and g as to move the pencil instead of revolving the cylinder,



FIG. No. 2.

which would, of course, revolve with the shifting of weight P.

It is hoped that the above account of what has been done may stimulate those who have the standard non-recording machines of the same to attach a recording device such as an indicator card cylinder machine like those used on steam engines. Of course, rather than go into elaborate calculations, it is better to merely calibrate by attaching standard weights or a series of them in place of the sample a and noting the points at which definite weights move the machine and the indicator cylinder. Of course with this indicator or self-registering device hysteresis could be determined, as well as total strength, etc.

The fullest data relating to the machine and experiments with it may be found in the "*Bulletin de la Société D'Encouragement pour l'Industrie Nationale*" Paris; Vol. 120, 113th year, No. 1, p. 20, July, 1913.

AMERICAN RUBBER BOOTS FOR THE ALLIES.

Rubber boots of course come under the classification of contraband of war, but inasmuch as the ocean steamers plying between English and American ports are not likely under present conditions to be seriously disturbed, some American manufacturers of footwear have evidently thought it quite safe to ship rubber boots for the use of the allied armies. Fourteen hundred cases—about 17,000 pairs—of short boots were shipped from Boston on the "*Scythian*," sailing September 24, an additional shipment of 10,000 pairs being made on the "*Arabic*," sailing from the same port October 6, and a like shipment leaving the next day also from the same port on the "*Bohemian*." These shipments are probably only the beginning of a large order for army use in the great European combat.

Recent Patents Relating to Rubber.

UNITED STATES OF AMERICA.

ISSUED SEPTEMBER 1, 1914.

- N**O. 1,109,048. Apparatus for forming and vulcanizing rubber articles. M. A. Dees, St. Louis, Mo.
 1,109,101. Pneumatic tire. H. R. Armstrong, Peoria, Ill.
 1,109,130. Pneumatic sole for shoe. J. C. Kava, Chicago, Ill.
 1,109,140. Life saving garment. D. W. O'Brien, Ballou, Canal Zone.
 1,109,151. Puncture healing liquid for tire. J. Simoni, Kew-Forest, N. J., assignor to H. Clark or, Fairport, N. Y.
 1,109,159. Vehicle tire. A. Ball, Canton, Ohio.
 1,109,173. Demountable vehicle rim. C. A. Myers, assignor to The Firestone Tire & Rubber Co., both of Akron, Ohio.
 1,109,180. Pneumatic plug for heels. B. Rosenberg, New York, N. Y.
 1,109,183. Ball. P. H. Schneider, Akron, Ohio.
 1,109,198. Spring tire. H. B. Bryan, assignor of one-half to L. D. Hobbs both of Johnson City, Ill.
 1,109,231. Bloomers with elastic waist band. M. E. Killean, San Francisco, Cal.
 1,109,249. Fountain pen filler. W. Rodger, Chicago, Ill.
 1,109,278. Tire protector. R. Bowen and W. F. Sweetey both of South-west, Pa.
 1,109,307. Tire reinforcement. C. Seewald, Williamsport, Pa.
 1,109,318. Surgical inhaler. A. W. Browne, Prince Bay, N. Y., and F. L. Wallace, Lansdowne, assignors to The S. S. White Dental Manufacturing Co., Philadelphia, both in Pennsylvania.
 1,109,504. Swimming apparatus—gown. N. L. Bernatzky, Petrograd, Russia.
 1,109,529. Process for effecting the separation of materials. R. Jaffé, Frankfort-on-the-Main, Germany.
 1,109,549. Spring wheel. C. Schvitz, Jacksonville, Fla.

Trade Marks.

- 70,753. Century Rubber Co., Plainfield, N. J. The word *Cic-Pa-Ra*. For pneumatic tires.
 71,915. Puncture Cure Sales Co., Newark, N. J. The word *Kor-Kor*. For puncture sealing compositions for pneumatic tires.
 76,328. The Santo Rubber Co., Wilmington, Del. The word *Santo*. For rubber belting, hose, vehicle tires, inner tubes, packing, etc.
 76,330. The Santo Rubber Co., Wilmington, Del. The word *Chief*. For rubber belting, vehicle tires, inner tubes, packing, etc.
 77,275. Essex Rubber Co., Trenton, N. J. The word *Redura*. For asbestos packing.

ISSUED SEPTEMBER 8, 1914.

- 1,109,757. Cushioned heel. T. J. Irwin, Trenton, N. J.
 1,109,784. Pneumatic tire shield. J. P. Quill, Chicago, Ill.
 1,109,816. Demountable tire rim. B. C. Ball and L. E. Younie both of Portland, Ore.
 1,109,819. Apparatus for treating fabrics. C. Buhl, assignor of one-half to S. D. McCausland both of Paterson, N. J.
 1,109,874. Supplementary cover or band for pneumatic tires. E. Scott, Wooler, England.
 1,109,939. Inner tube for double tube pneumatic tires. W. M. Reason, Pontiac, Mich.
 1,109,970. Pneumatic tire. A. A. Dennis, Grand Rapids, Mich.
 1,109,972. Pneumatic tire. L. Dunn, assignor to Hercules Tire Co.—both of New Orleans, La.
 1,109,973. Wheel tire. L. Duval, Newton, Mass.
 1,109,977. Drying machine. W. R. Files, Providence, R. I.
 1,109,995. Spring tire. J. Kravcak, Paterson, N. J.
 1,110,107. Non-skidding device. J. Bropson, Cleveland, Ohio.
 1,110,264. Detachable shoe heel. F. A. Isaacson, Madrid, Ia.

Designs.

- 46,359. Vehicle tire. G. W. Daum and G. W. Shiveley—both of Jeannette, Pa.
 46,367. Rubber tire. J. S. McClurg, assignor to The Pharis Tire & Rubber Co.—both of Newark, Ohio.

Trade Marks.

- 55,964. J. W. Patterson, New York, N. Y. The word *Alibi* in white letters on a black background. For chewing gum.
 57,679. F. Soenneken, Bonn, Germany. An illustration of a stub pen through the center of a writing tablet, with an eagle perched on the top. For penholders made of vulcanite.
 75,193. A. K. Draper, Chicago, Ill. The word *N-Jack-O* in white letters on a black background. For a compound for making waterproof cotton and woolen fabrics or leather.
 76,913. The Auto-Gray Manufacturing & Medical Co., Denver, Col. The word *Auto-Gray*. For syringes.
 78,603. Clement Restein Co., Philadelphia, Pa. The word *Belmont*. For fiber and rubber packings.
 78,895. The Toronto Rubber Co., Toronto, Ohio. The word *Ac-Onite*. For rubber tires, rubber packing, inner tubes, hose, belting, etc.
 78,897. The Toronto Rubber Co., Toronto, Ohio. The word *Ac-Onite*. For rubber mats and matting.
 79,389. H. G. Macwilliam, New Rochelle, N. Y. The word *President*. For suspenders.

ISSUED SEPTEMBER 15, 1914.

- 1,110,340. Machine for treating rubber. J. Norzagaray, assignor to The Economic Rubber Machine Machine Co., Ltd. both of London, England.
 1,110,353. Rubber soled shoe. C. B. Slater, Boston, Mass., assignor of one-half to Flexible Rubber Goods Co., Salisbury, Conn.
 1,110,451. Pneumatic tire for vehicles. I. S. McGiehan, London, England.
 1,110,488. Rubber tire. C. Fenders, New York, N. Y.
 1,110,541. Interchangeable block tire. E. R. Hewitt, Rugwood, N. J., assignor to Hewitt Motor Co., New York, N. Y.
 1,110,614. Life saving appliance. S. P. Edmonds, Catonsville, Md.
 1,110,634. Non-skipping low shoe. G. Guntre, Capitol View, Md.
 1,110,640. Pneumatic tire having a foundation fabric consisting of natural silk incorporated with india rubber. W. E. Muntz, London, England.
 1,110,671. Manufacture of rubber hose. H. Z. Cobb, Winchester, Mass.
 1,110,672. Resilient tire for vehicle wheels. G. Corrado, Perth Amboy, assignor of three-twentieths to A. J. Ferrato, Cliffside; three-twentieths to A. J. Perone, Palisades, and two-twentieths to C. H. Kay or, West Orange, all in New Jersey.
 1,110,674. Catamenial appliance. J. B. Des Rosiers, Providence, R. I.
 1,110,730. Rubber heel. J. G. Tuftord, assignor of one-sixth to C. H. Trayer, one-sixth to A. G. Smith, and one-twelfth to W. C. Smith, all of Parma, Ohio.
 1,110,750. Resilient tire for motor cars and other vehicles. H. Diamant, Middlesex, England.
 1,110,800. Machine for inserting wires in the rim engaging portion of solid tires. C. Kuentzel, assignor to the Goodyear Tire & Rubber Co., both of Akron, Ohio.
 1,110,916. Auto tire saving device. C. J. Fisk and E. Lindblom both of Bismarck, N. D.
 1,110,956. Artificial hat. W. F. McBride, Warsaw, Ind.
 1,110,959. Bath tub silencer. G. A. Niewiadowski, Cleveland, Ohio.

Designs.

- 46,408. Bathing cap. J. A. Murray, assignor to The Seamless Rubber Co., both of New Haven, Conn.
 46,409. Bathing cap. J. A. Murray, assignor to The Seamless Rubber Co., both of New Haven, Conn.
 46,410. Bathing cap. J. A. Murray, assignor to The Seamless Rubber Co., both of New Haven, Conn.

Trade Mark.

- 78,876. The Master Car Builders' Association, Chicago, Ill. The initials *MCB*. For rubber hose.

ISSUED SEPTEMBER 22, 1914.

- 1,111,010. Life preserver. J. Depta, Passaic, N. J.
 1,111,094. Bath tub appliance comprising a pneumatic cushion. F. C. Rehm, assignor of one-half to C. Nelson—both of Detroit, Mich.
 1,111,095. Tire protector. A. Riemann, New York, N. Y.
 1,111,145. Vehicle wheel. E. J. Fillingim, Pace, Fla.
 1,111,149. Penholder for multicolor writing. L. B. Halverson, Flandreau, S. D.
 1,111,170. Skiving machine. E. Nall and W. C. Tyler, assignors to The Goodyear Tire & Rubber Co.—all of Akron, Ohio.
 1,111,171. Resilient vehicle tire. W. M. Nevotti, Omaha, Neb.
 1,111,188. Overshoe. J. T. Simpson, Chicago, Ill.
 1,111,204. Spring wheel. A. W. Yeungkvist, assignor to Easy Auto Wheel Co.—both of Duluth, Minn.
 1,111,232. Method of and machine for folding the edges of rubber sheets. J. E. Perrault, Belmont, assignor to Hood Rubber Co., Watertown—both in Massachusetts.
 1,111,317. Shoe last with cavity having filling of resilient material. J. Pacelli, New York, N. Y.
 1,111,404. Protector for tires. C. A. Pettie, New York, N. Y.
 1,111,418. Manufacture of vehicle tires. F. L. O. Wadsworth, Sewickley, Pa.
 1,111,419. Construction of vehicle tires. F. L. O. Wadsworth, Sewickley, Pa.
 1,111,423. Demountable rim for vehicle wheels. J. L. Webster, Chicago, Ill.
 1,111,436. Shoe sole vulcanizing and applying apparatus. G. F. Butterfield, assignor to G. I. Butterfield—both of Cambridge, Mass.
 1,111,437. Composite boot and shoe. G. F. Butterfield, assignor to G. I. Butterfield—both of West Newton, Mass.
 1,111,519. Fountain pen. F. M. Ashley, New York, N. Y.
 1,111,642. Toy balloon. F. F. Brucker, assignor to The Miller Rubber Co.—both of Akron, Ohio.
 1,111,643. Rubber backed brush for applying polish. L. W. Ballard, Cumberland, Md.

Designs.

- 46,428. Vehicle tire. J. Christy, Akron, Ohio.
 46,434. Vehicle tire. R. J. Marshall, assignor to The Morgan and Marshall Rubber & Tire Co.—both of East Liverpool, Ohio.
 46,447. Pneumatic tire. T. R. Palmer, Erie, Pa.

Trade Marks.

- 7,952 Resistol Process Co., Chicago, Ill. The word *Resistol*. For waterproof fabrics, waterproof sheeting, etc.
 7,928 H. W. Johns-Manville Co., New York, N. Y. The initials *J-M*. For rubber belting, hose, etc.
 7,854 Paxton & Gallagher Co., Omaha, Neb. The word *Monitor*. For outboard motors, inner tubes, boots, etc.

ISSUED SEPTEMBER 29, 1914.

- 1,111,802 Method of forming patches for rubber articles. J. G. Moomy, Erie, Pa.
 1,111,803 Method of forming patches for rubber articles. J. G. Moomy, Erie, Pa.
 1,111,804 Patching rubber articles and process of manufacture. J. G. Moomy, Erie, Pa.
 1,111,807 Spring wheel. F. M. Ross and H. G. Horstman, assignors of one fourth to W. W. Baxter and one fourth to T. Horstman—all of Cincinnati, Ohio.
 1,111,887 Spring wheel. J. S. Culp, Elkhart, Ind.
 1,111,903 Apparatus for pneumatic tires. R. C. Purvis, Seaford, Del.
 1,111,907 Vulcanizing apparatus. A. G. Anderson, Chicago, Ill.
 1,111,914 Exercising apparatus. R. J. R. Caines, Boston, Mass.
 1,111,916 Resilient wheel. A. Cane, Oakland, Cal.
 1,111,967 Sanitary entomological garment. J. G. Kovira, New York, N. Y.
 1,111,968 Surgical irrigating apparatus. L. J. Stilling, Newark, N. J.
 1,111,201 Shoulder support for personal wear comprising inflatable bulbous elastic cushions. F. W. Ersfeld, New York, N. Y.
 1,111,48 Woman's reversible and adjustable house dress having a belt comprising telescoped elastic and inelastic portions. W. C. P. Baldwin, Holyoke, Mass.
 1,111,85 Spring wheel. H. S. Gover, Bel Air, Md.
 1,111,896 Spring wheel. O. F. Miller, New Milford, Pa.
 1,111,896 Curing machine. C. H. Roper, Belmont, assignor to Hood Rubber Co., Watertown, both in Massachusetts.
 1,111,353 Tire protector. V. L. Bowman, Oakland, Cal.
 1,111,362 Fountain pen feed bat. D. C. Demarest, Passaic, N. J.

Design.

- 1,111,802 Design. J. R. McKenna, East Palestine, Ohio.

Trade Mark.

- 7,952 H. B. Klumpp Rubber Co., New York, N. Y. The word *Tango*. For dress shields.

NOTE.—Printed copies of specifications of United States patents may be obtained from the India Rubber World office at 10 cents each, postpaid.]

GREAT BRITAIN AND IRELAND.

PATENT SPECIFICATIONS PUBLISHED.

1,111,807 given to that assigned to the Patent at the filing of the application in the case of these listed below was in 1913.

*Don'ts Patents for American Inventions.

- 1,111,807 [THE ILLUSTRATED OFFICIAL JOURNAL, SEPTEMBER 2, 1914.]
 1,111,807 Vehicle wheel rim. C. F. Walker, Blackian Tannery, St. James Road, Northampton.
 1,111,808 Detachable rim attachments to wheels. W. D. D. Jones, 18, College street, Lambeth, London.
 1,111,809 Spring for wearing apparel. K. Gosman, 17, Kluserstrasse, Elberfeld, Germany.
 1,111,810 Tire tread consisting of a rubber or similar upper surface and a sheet metal foundation. C. L. Githber, 27, Great Eastern street, London.
 1,111,811 Patching patches. J. G. Moomy, 33 East Eleventh street, Erie, Pa., U. S. A.
 1,111,812 Spring wheel. J. A. Roach and S. A. Gouard, Seminary street, St. John, Ontario, Canada.
 1,111,813 Spring wheel with continuous elastic tire. O. H. Hinds, 10, Fairbank street, Los Angeles, Cal., U. S. A.
 1,111,814 Curing machine. D. K. Koe, 435 Riverside Drive, New York, N. Y., U. S. A.
 1,111,815 Curing machine. A. Palouze, 94, Boulevard Carl Vogt, Geneva, Switzerland.
 1,111,816 Tire protector. V. L. Bowman, 77, Rue DeFaqz, London.
 1,111,817 Design. P. A. N. Smith, 1, Beccas Buildings, 1, Beccas Buildings, London.
 1,111,818 [THE ILLUSTRATED OFFICIAL JOURNAL, SEPTEMBER 9, 1914.]
 1,111,818 Vulcanizing device. F. L. B. B. dell, 4, West Kensington, London.
 1,111,819 Exercising apparatus. D. K. Koe, 435, River-side Drive, New York, N. Y., U. S. A.
 1,111,820 Instrument for curing tires. T. T. Smith, 1, Erie, Pa., U. S. A.
 1,111,821 Tire comprising one or more rings of Spanish cane seated in a rubber bed. F. Zatl and J. Zatl, Olm, Post Alton, Norderdamm, Germany.
 1,111,822 Tire comprising one or more rings of Spanish cane seated in a rubber bed. F. Zatl and J. Zatl, Olm, Post Alton, Norderdamm, Germany.
 1,111,823 Tire comprising one or more rings of Spanish cane seated in a rubber bed. F. Zatl and J. Zatl, Olm, Post Alton, Norderdamm, Germany.
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 1,111,830 Tire comprising one or more rings of Spanish cane seated in a rubber bed. F. Zatl and J. Zatl, Olm, Post Alton, Norderdamm, Germany.
 1,111,831 Tire comprising one or more rings of Spanish cane seated in a rubber bed. F. Zatl and J. Zatl, Olm, Post Alton, Norderdamm, Germany.
 1,111,832 Tire comprising one or more rings of Spanish cane seated in a rubber bed. F. Zatl and J. Zatl, Olm, Post Alton, Norderdamm, Germany.
 1,111,833 Tire comprising one or more rings of Spanish cane seated in a rubber bed. F. Zatl and J. Zatl, Olm, Post Alton, Norderdamm, Germany.
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 1,111,895 Tire comprising one or more rings of Spanish cane seated in a rubber bed. F. Zatl and J. Zatl, Olm, Post Alton, Norderdamm, Germany.
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 1,111,897 Tire comprising one or more rings of Spanish cane seated in a rubber bed. F. Zatl and J. Zatl, Olm, Post Alton, Norderdamm, Germany.
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 1,111,899 Tire comprising one or more rings of Spanish cane seated in a rubber bed. F. Zatl and J. Zatl, Olm, Post Alton, Norderdamm, Germany.
 1,111,900 Tire comprising one or more rings of Spanish cane seated in a rubber bed. F. Zatl and J. Zatl, Olm, Post Alton, Norderdamm, Germany.

- 1,111,885 (1913). Tire attachment to rim. C. T. B. Sangster, Dale Road, Bournbrook, Birmingham.
 1,111,886 (1913). Vulcanizing rubber. Farbenfabriken vorm. F. Bayer & Co., Leverkusen, near Cologne, Germany.
 *1,111,887 (1913). Pressure gage for pneumatic tires, etc. J. B. Polo, Clear Lake, S. D., U. S. A.
 1,111,888 (1913). Vulcanizing india rubber. Farbenfabriken vorm. F. Bayer & Co., Leverkusen, near Cologne, Germany.
 1,111,889 (1913). Cushion. R. G. Cope, Bradford House, Bloxwich, Staffordshire.

ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, SEPTEMBER 16, 1914.]

- *1,111,890 (1913). Life buoy. J. J. Puskanen, Chisholm, Minn., U. S. A.
 1,111,891 (1913). Rubber and leather insoles and soles. Soc. Francaise du cuir Anne, 118, Rue de Valenciennes, Paris.
 1,111,892 (1913). Spring wheel. B. B. Roberts, Park House, Cimla, and J. Walters, Maesgwyn, Groll Park Road—both in Neath, Glamorganshire.
 1,111,893 (1913). Spring wheel. S. P. Neuhausen, 3934 North Francisco avenue, Chicago, Ill., U. S. A.
 1,111,894 (1913). Coating metals. J. Troncl, 6, Leijzigerstrasse, Berlin.
 1,111,895 (1913). Machine for making tire fabric. J. W. H. Dew, 8, Laurence Pountney Hill, Cannon street, London.
 1,111,896 (1913). Elastic webbing. W. J. Taylor, "Wimmera Lodge," Salisbury Road, Walthamstow, and W. Williams & Son, 53, Bread street, both in London.
 1,111,897 (1913). Jar closure comprising a rubber ring. A. Dunhill, 31, Duke street, St. James's, London.
 1,111,898 (1913). Raising sunken submarines by inflated balloons. L. Pouty, 30, Rue du Bois Joli, and A. Vian, 119, Rue des Hauts Pavés—both in Nantes, France.
 *1,111,899 (1913). Eraser. M. F. Hayes, 152 East Forty eighth street, New York, N. Y., U. S. A.
 1,111,900 (1913). Tapping rubber trees, etc. E. L. Walker, Hewagam Estate, Padukka, Ceylon.
 1,111,901 (1913). Wheel tire. F. E. Rouse, 37, Queen Victoria street, London.
 1,111,902 (1913). Cap cover made of waterproof material. I. Berks, 142, Bevois street, St. Mary street, Southampton.
 *1,111,903 (1913). Spring wheel with rubber tire. H. Kirby, 163 Main street, Middletown, Conn., U. S. A.

ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, SEPTEMBER 23, 1914.]

- 1,111,904 (1913). Dust shields for coaches. H. W. Ellis, 267, Coventry Road, Ilford, London.
 *1,111,905 (1913). Vehicle wheel. J. A. Glenn, 80 Howard street, Albany, N. Y., U. S. A.
 1,111,906 (1913). Non-skid device for twin tires. C. A. Boevey, 8, Church Circle, South Farnborough, Hampshire.
 1,111,907 (1913). Spring wheel with pneumatic cushion. H. A. B. Anthony, "Gledthorpe," Thame, Oxfordshire.
 1,111,908 (1913). Röntgen ray apparatus comprising a rubber cap. H. C. Snook, 115 Bryn Mawr avenue, Cynwyd, Pa., U. S. A.
 1,111,909 (1913). Vent peg comprising a rubber sleeve. J. J. Abbin, 27, Patrick street, Mountmellick, Queen's Co.
 1,111,910 (1913). Detachable rim attachment to wheel. W. J. Lane, 16 Tacoma avenue, Youngstown, Ohio, U. S. A.
 1,111,911 (1913). Wheel tire. R. Rowley, 170 Broadway, New York, N. Y., and J. J. Coomber, 326 Old Bergen Road, Jersey City, N. J., both in U. S. A.
 1,111,912 (1913). Spring wheel. G. H. Robinson, 144, Queen's Road, Bayswater, London.
 1,111,913 (1913). Tread surfaces for pneumatic tire. M. C. Overman, 391 West End avenue, New York, N. Y., U. S. A.
 1,111,914 (1913). Golf ball cleaner. L. H. Bennett and C. H. Bennett, "Trimpey," Old Warwick Road, Olton, Warwickshire.
 1,111,915 (1913). Tread projection for wheel tire. W. F. Muntz, 89, Pall Mall, London.
 1,111,916 (1913). Wheel tire. F. W. Fort, 39, Bridge street, Northampton.
 1,111,917 (1913). Vehicle wheel. R. T. Smith, 111, Lovely Lane, Warrington, Lancashire.
 1,111,918 (1913). Waterproof fabrics in ornamental effects. L. Frankenstein, Victoria Rubber Works, Newton Heath, Manchester.
 1,111,919 (1913). Valve for pneumatic tire. L. Lefebvre, 217, Venloerstrasse, Ehrenfeld, Cologne, Germany.
 1,111,920 (1913). Tire consisting of non-inflated rubber cells in a state of compression. G. Surgo, Litchard, Bridgend, Glamorganshire.
 1,111,921 (1913). Inflating valves for footballs, air beds, cushions, pneumatic tires, etc., comprising a flattened elastic tube. A. Good, 63, Grove Road, Walthamstow, London.
 1,111,922 (1913). Vulcanizing india rubber. P. A. Newton, 6, Brems Buildings, Chancery Lane, London.
 1,111,923 (1913). Belt fastener comprising pads of rubber. R. L. Blanc, La Valette, Macon Michaud, St. Etienne, France.
 1,111,924 (1913). Synthetic caoutchouc products. J. Y. Johnson, 47, Lincoln's Inn Fields, London.
 1,111,925 (1913). Synthetic caoutchouc products. J. Y. Johnson, 47, Lincoln's Inn Fields, London.

- [ABSTRACTED IN THE INDIA RUBBER WORLD JOURNAL, SEPTEMBER 30, 1914.]
- 12,904 (1913) Elastic compositions consisting essentially of rubber and vulcanizable fibres, for making hoofgads. F. W. Kremer, Carlstadt, N. J., U. S. A.
- 12,957 (1913) Means for keying in a rubber or other paving blocks to a concrete or like material. A. J. Pfeiffer, 3, St. Helen's Place, London.
- 12,986 (1913) Synthetic caoutchouc substance. J. A. Johnson, 47, Lincoln's Inn Fields, London.
- 13,007 (1913) Connecting supports to wheels and sole. J. R. Sprad, 4, Rickingate, Carlisle.
- 13,054 (1913) Detachable rim. H. Mote, 101 Wayne County Bank Buildings, Detroit, Mich., U. S. A.
- 13,338 (1913) Chain cover comprising a rubber washer. S. Choold, Waterside For Works, Clegham, Buckinghamshire.
- 13,338 (1913) Driving belt having friction blocks of rubber suspended by metal frames. C. J. Routh, 15, Schenstrasse, Berlin.
- 13,385 (1913) Tread band for wheels. F. W. Farr, 50, Bridge Street, Northampton.
- 13,390 (1913) Wheel tire tread band. J. Scott, Cycle Works Market Place, Wether, Northumberland.
- 13,430 (1913) Waterproof material for protecting passengers and tops of vehicles. B. S. Kennell, 31, Chester Buildings, Diamond Grove, Camberwell, and C. H. Workman, 60, Aberlure Gardens, South Hampstead, both in London.
- 13,438 (1913) Treating latex. S. C. Davidson, Sirocco Engineering Works, Belfast.
- 13,444 (1913) Floats of gas tight fabric impregnated with rubber, for raising sunken ships. L. Vincina, 8, Via Gaspara Stampa, Trieste, Austria.
- 13,451 (1913) Molding rubber articles. J. T. Brierley, "Highfield," and Leyland & Birmingham Rubber Co., Golden Hill Works, both in Leyland, Lancashire.

NEW ZEALAND.

- [ABSTRACTED IN THE PATENT OFFICE JOURNAL, JULY 30, 1914.]
- 31,840 (1913) Resilient wheel with pneumatic rotating cushions. R. F. P. Patent Wheels Proprietary, Ltd., of Tuckett Chambers, 359 Collins street, Melbourne, Victoria.

THE FRENCH REPUBLIC.

PATENTS ISSUED (With Dates of Application).

- 469,415 (March 9, 1914). Rubber heel for footwear. A. Guénès.
- 469,498 (March 11). Press for joining the soles to footwear by the help of an agglutinant. Continental Caoutchouc & Gutta Percha Co.
- 469,536 (March 20). Mudguard for automobiles and other vehicles. E. Emery.
- 469,780 (May 28, 1913). Elastic cover for wheels of automobiles and other vehicles. G. G. Chapelet.
- 469,933 (March 24, 1914). Process for making air chambers for pneumatic tires. R. T. Henderson.
- 470,019 (June 5, 1913). Non-pneumatic elastic tire for vehicle wheels. E. G. Ort.
- 470,020 (June 5). Improvements in tire rims, applicable to wheels of vehicles in use. J. L. Gommeret.
- 470,089 (March 25, 1914). System of tires for cycles. M. Regnier.
- 470,065 (March 26). Protection for pneumatic tires. Herkules Pneumatik-Werke, G. m. b. H.
- 470,078 (June 6, 1913). Process, ensuring the protection and resistance of natural or artificial rubber, pure or mixed, and of similar products. Madame Eve Marnette.
- 470,090 (January 12, 1914). Elastic wheel for automobile and other vehicles. M. S. de Camille.
- 470,133 (March 16). Process of manufacture of all kinds of rubber tires. H. Wipfel and The Rubber Pneumatic Tire Co.
- 470,135 (March 16). Pneumatic tire for motor cars. C. Herrmann.
- 470,179 (March 18). Method of joining rubber tires. A. Gouze and M. L. Roubil.
- 470,181 (March 25). Vehicle wheel for automobile. A. Bourreau.
- 470,167 (March 26). Improvements in tire cushions. Madame M. M. L.
- 470,180 (June 12, 1913). Vehicle wheel with elastic tire. H. Eblert.
- 470,162 (March 18, 1914). Improvements in non-inflating pneumatic tires. F. Nothmann and L. Eblert.
- 470,187 (April 16). New rubber substitute for waterproofing and similar operations, and process for its manufacture. G. d'Almeida.
- 470,177 (March 30). Process for preparing a material for hollow printing, by using sensitive layers of like and unlike substances for the one part, and bitumen and like substances for the other part. J. Richter.
- 470,446 (April 20). Mudguard tire cushion intended for wheels of heavy weight vehicles. A. Eulert.

[NOTE: Printed copies of specifications of French patents can be obtained from R. Bolet, Ingenieur Conseil, 16 avenue de Villiers, Paris, at 50 cents each postpaid.]

THE GERMAN EMPIRE.

PATENTS ISSUED (with Dates of Validity).

- 778,351, Class 471 (September 24, 1913). Apparatus for attaching repair patches to the inner walls of hose. Leopold Piehl, Trebnitz, Silesia.
- 778,430, Class 30d (January 3, 1914). Bandage for ruptures. Heinrich Carl H. Bandagen Fabrik, Lahr, Baden.

- 78,564, Class 63 (June 1, 1913). S. rollers with air chambers for motor truck wheels. On. Schlegel, Berlin Pankow.
- 78,606, Class 30g (September 24, 1913). Nursing bottle. Wilhelm Dettmer and Jean Bruner, Cologne.
- 78,688, Class 471 (February 2, 1914). Vacuum container for compressed air tanks. Gottlieb Auerbach, Esslingen.
- 78,824, Class 39b (April 14, 1913). Improvement of insufficiently polymerized rubber material. The B. F. Goodrich Co., New York.
- 78,975, Class 471 (December 5, 1913). Self-stuffing box packing. A. Galen, Leiden-dorff & Co., Mulheim-Rh.

INDIA RUBBER GOODS IN COMMERCE.

EXPORTS FROM THE UNITED STATES.

OFFICIAL statement of values of exports of manufactures of india rubber and gutta percha for the months of July and August, 1914, and for the first eight months of five calendar years.

MONTHS.	Belting, Packing and Hose.	Boots and Shoes.	All Other Rubber.	TOTAL.
July, 1914	\$188,774	\$103,862	\$686,645	\$979,281
August, 1914	128,958	42,941	343,073	514,972
January-June	1,118,298	415,672	3,680,007	5,213,977
Eight months, 1914	\$1,436,030	\$562,475	\$4,709,725	\$6,708,230
Eight months, 1913	1,680,443	856,050	5,865,815	8,402,308
Eight months, 1912	1,650,887	850,879	5,356,274	7,858,040
Eight months, 1911	1,482,052	1,175,597	4,815,708	7,473,357
Eight months, 1910	1,431,382	1,347,749	3,798,848	6,577,979

The above heading, "All Other Rubber," for the months of July and August, 1914, and for the first eight months of three calendar years, includes the following details relating to tires:

MONTHS.	For Automobiles.	All Other.	TOTAL.
July, 1914	\$341,617	\$36,279	\$377,896
August, 1914	188,002	33,063	221,065
January-June	1,760,475	259,873	2,020,348
Eight months, 1914	\$2,290,094	\$329,215	\$2,619,309
Eight months, 1913	2,922,200	387,515	3,309,715
Eight months, 1912	2,240,826	393,441	2,634,267

STATEMENT OF THE INDIA RUBBER WORLD.

Statement of the ownership, management, circulation, etc., required by the Act of August 24, 1912, of THE INDIA RUBBER WORLD, published monthly at New York, N. Y., for October 1, 1914.

Editor, Henry C. Pearson, Tompkins Corners, Putnam Co., New York.

Managing Editor, John P. Lyons, 201 West 105th street, New York.

Business manager, Henry C. Pearson, Tompkins Corners, Putnam Co., New York.

Publishers, The India Rubber Publishing Co., 25 West Forty-fifth street, New York.

Owner, Henry C. Pearson, Tompkins Corners, Putnam Co., New York.

Known bondholders, mortgagees, and other security holders, holding 1 per cent. or more of total amount of bonds, mortgages, or other securities: None.

(Signed) JOHN P. LYONS, Managing Editor.

Sworn to and subscribed before me this first day of October, 1914.

(Signed) HELEN HEROLD, Notary Public,

New York County No. 1723.

[Seal]

New York County register No. 5202. Certificate filed in Kings County Register's office No. 6679. (Term expires March 30, 1915.)

BALLOONS IN WARFARE.

The first balloon used in warfare was that which, on September 23, 1870, ascended from Paris, piloted by the aeronaut Durouf, with 250 pounds of letters, and after three hours' flight descended at Evreux, beyond the lines of the besieging Prussians. Sixty-five balloons, each costing about \$1,000, were similarly despatched from Paris during that siege, carrying from 200 to 1,000 pounds of letters each. All such letters were written on very thin paper, the reverse side having printed on it news of the besieged city.

Review of the Crude Rubber Market.

New York, October 30, 1914.

THE principal feature of the New York hard line Pará market during the month of October was its relative steadiness.

On September 30 it stood at 65/66 cents; rising on October 1 to 66 1/2 cents and dropping again on the 7th to 64/65 cents. It remained at this price till the 21st, when it rose to 66 cents, at which point it stood on the 30th.

Firmness marked the early days of the month, but manufacturers showed no disposition to anticipate supplies to an important extent. A good demand from tire making concerns was, however, noted from the West. One important concern was reported to be operating to 80 per cent. of its capacity.

Towards the middle of the month the improved export trade in rubber goods and other demands had reacted beneficially on the tone of the rubber market, price-cutting having almost entirely disappeared. Some of the leading grades of Pará rubber sold at an advance of 1 cent on the price of a week earlier. The closing week of the month displayed increased firmness.

Plantation rubber likewise remained steady during the greater part of the month, on the basis of 58/60 cents for pale crepe; advancing on the 22nd to 61 cents, at which it stood on the 30th.

Arrivals of plantation rubber were extensive, but were understood to be largely in execution of contracts.

The latest advices from London report a firm market at recent quotations, there being no pressure to sell. London imports for the month of September included 3,523 tons plantation, while deliveries represented 3,452 tons. Stocks of plantation aggregated 3,303 tons on September 30, 1913, and 3,595 tons on the same date this year. Deliveries were thus nearly keeping pace with imports, receipts having been fairly well disposed of.

Owing to the accumulation in London of brown, specky and dark qualities of plantation, low prices have been current there for these grades.

An estimate quoted by Consul General L. Drier, of Singapore, places the aggregate output of the Straits Settlements and the Federated Malay States for 1914 as about 69,326,269 pounds, the total for the first 6 months of this year being 34,510,939 pounds. There is no longer fear of a shortage, two steamers having alone brought between them 2,100 tons to London. Stocks are reported to be steadily diminishing. According to the most recent advices, no date has been fixed for the resumption of auctions.

By latest reports, large quantities of rubber are being shipped from New York by the principal dealers. The quantity for October has been estimated as 200 to 300 tons for Norway, Sweden, Denmark, Holland and Italy. Though it has been supposed that some of this rubber may have been ultimately intended for Germany, it is generally believed that the bulk of it is meant for consumption in the countries to which it is shipped.

The Norwegian manufacturing industry is obliged to undertake the manufacture of boots and shoes for the home trade, seeing that the supply from Russia is cut off. On account of this development the purchases of crude rubber by Norwegian manufacturers are unprecedentedly large.

The strength of the New York market for plantation rubber has been partially attributed to sinking of the steamer "Troilus" in the Indian Ocean, with 1,200 tons of crude rubber, by a German cruiser, and other losses from the same cause.

Crop returns for nine months, to end of September, as cabled, included the following:

	1913,	1914,
Anglo Malay	Pounds 974,375	1,016,571
Pataling	366,111	418,706
London Asiatic	722,394	794,295
Golden Hope	129,658	116,530
Selaba	304,399	391,222
Rubber Estates of Johore	200,159	378,275

Production by the larger plantations is evidently being kept up.

The Antwerp rubber market has been transferred to London, and the additional supplies have materially contributed to supplying needs. A strong demand has been noticeable from Russia.

Satisfaction has been expressed at the manner in which the English market has so far surmounted the difficulties anticipated at the opening of hostilities. Receipts are fully up to expectations. Importers are therefore obliged to meet the market.

NEW YORK QUOTATIONS.

Following are the quotations at New York one year ago, one month ago, and October 30, the current date:

PARA.	Nov. 1, '13.	Oct. 1, '14.	Oct. 30, '14.
Islands, fine, new.....	66@67	48@50	50@52
Islands, fine, old.....	.....	50@52	52@53
Upriver, fine, new.....	73@74	63@65	65@66
Upriver, fine, old.....	76@80	66@68	67@69
Islands, coarse, new.....	28@29	26@28	27@28
Upriver, coarse, new.....	46@47	44@45	47@48
Upriver, coarse, old.....	.....	.....	.....
Cameta	36@37	28@29	30@31
Caucho, upper	43@44	44@45	46@47
Caucho, lower .....	.....	41@43	41@43

PLANTATION CEYLON.

Fine smoked sheet.....	59@60	63@64	65@66
Fine pale crepe { near-by }	53@54	61@62	61@63
{ forward }	59@60	60@61

Fine sheets and biscuits unsmoked	51@52	59@60	60@61
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CENTRALES.

Corinto	40@42	45@46 1/2
Esmeralda, sausage	40@41	40@41	44@45
Guayaquil, strip
Nicaragua, scrap	37@39	40@41	44@45
Panama .....	.....	.....	.....
Mexican plantation, sheet .....	.....	35@45	37@39
Mexican, scrap	37@38	39@41	40@42
Mexican, slab .....	.....	.....	.....
Mangabeira, sheet .....	.....	.....	40@42
Guayule .....	.....	45@50	.....
Balata, sheet	63@64	54@56	51@52
Balata, block	44@45	43@47	43@44

AFRICAN.			
Lopori, ball, prime.....	47a 48	.....	52a 55
Lopori, strip, prime.....	.....	.....	.....
Aruwimi	37a 38	.....	.....
Upper Congo, ball red....	45a 46	.....	.....
Ikelemba .....	.....	.....	.....
Sierra Leone, 1st quality.	45a 46	.....	.....
Massai, red .....	.....	.....	54a 58
Soudan Niggers .....	.....	.....	.....
Cameroon, ball	33a 40	42a 44	44a 45
Benguela .....	.....	.....	31a 33
Madagascar, pinky .....	.....	.....	.....
Accra, flake	20a 22	.....	25a 26
EAST INDIAN.			
Assam .....	.....	52a 58	54a 58
Pontianak	6a 6 1/2	8a 9	8a 9
Borneo, II, or 2nd.....	.....	.....	35

New York.

In regard to the financial situation, Albert B. Beers (broker in crude rubber and commercial paper, No. 68 William street, New York) advises as follows. "The first half of October the market for commercial paper remained about the same as during August and September, the demand being very light and rates ruling anywhere from 7 1/2 to 9 per cent. for various rubber names, but the latter part of the month the situation improved considerably and the demand for paper increased, and some of the best names went as low as 6a 6 1/2 per cent., and those not so well known 7a 7 1/2 per cent."

NEW YORK PRICES FOR SEPTEMBER (NEW RUBBER)

	1914.	1913.	1912.
Upvulca, fine	\$0.64 a 0.78	\$0.80 a 0.90	\$1.10 a 1.22
Upvulca, coarse	43 a 55	48 a 52	52 a 55
Islands, fine	53 a 70	71 a 77	1.07 a 1.13
Islands, coarse	27 a 35	28 a 31	55 a 59
Camata	5a 36	36a 39	61a 67

IMPORTS FROM PARA AT NEW YORK.

[The Figures Indicate Weight in Pounds.]

SEPTEMBER 28. By the steamer *Stephen* from Pará and Manáos.

	Fine.	Medium.	Coarse.	Caucho.	Total.
Arnold & Zeiss.....	241,400	28,900	140,600	207,200=	618,100
Meyer & Brown.....	160,900	15,000	159,200	78,500	413,600
General Rubber Co.....	81,300	19,100	6,000	.....	107,300
Henderson & Korn.....	227,000	75,500	23,800	46,000=	372,300
H. A. Astlett & Co.....	27,400	18,300	22,300	.....	68,000
Robinson & Co.....	8,700	.....	1,800	.....	30,500
Albans' Successors, Ltd.....	89,000	8,700	18,000	.....	115,700
G. Amsinck & Co.....	25,300	.....	700	3,600=	29,600
Crossman & Sucklen.....	7,500	.....	4,000	.....	7,100
W. R. Grace & Co.....	400	.....	.....	600	1,000
Total	863,900	165,500	397,900	335,500	1,763,200

OCTOBER 9. By the *Dunstan*, from Pará

Arnold & Zeiss.....	48,600	5,000	.....	20,000	73,600
Meyer & Brown.....	38,000	4,300	54,100	38,500=	135,400
General Rubber Co.....	9,100	1,400	500	700=	11,500
Henderson & Korn.....	30,800	18,400	9,900	1,600=	60,700
H. A. Astlett & Co.....	.....	.....	2,600	.....	2,600
Johnstone, Whitworth & Co.....	31,800	.....	.....	.....	31,800
W. R. Grace & Co.....	21,900	.....	.....	.....	21,900
G. Amsinck & Co.....	2,300	.....	.....	.....	2,300
Total	181,700	9,100	66,900	61,100	339,800

OCTOBER 10. By the *Minas Gerais*, from Pará.

Arnold & Zeiss.....	38,100	.....	97,000	9,200=	144,300
Meyer & Brown.....	4,600	1,100	8,400	.....	14,100
Albans' Successors, Ltd.....	17,000	1,000	27,000	2,000	47,000
Henderson & Korn.....	7,700	5,000	17,200	.....	49,900
Johnstone, Whitworth & Co.....	18,600	.....	.....	.....	18,600
H. A. Astlett & Co.....	16,100	2,500	20,000	19,700=	58,300
G. Amsinck & Co.....	.....	.....	.....	3,100=	3,100
Total	122,100	9,600	169,600	34,000	335,300

OCTOBER 16. By the *Bonitace*, from Pará and Manáos.

Arnold & Zeiss.....	19,700	4,500	81,600	62,600=	341,100
Henderson & Korn.....	170,200	39,000	59,200	30,900=	299,500
General Rubber Co.....	20,100	45,800	27,400	900=	276,200
Meyer & Brown.....	155,400	3,700	49,700	5,700=	234,000
Robinson & Co.....	141,800	.....	15,100	300=	157,200
H. A. Astlett & Co.....	43,500	5,700	15,600	15,600=	80,400
Albans' Successors, Ltd.....	32,000	6,000	30,000	14,000=	82,000
Hagemeyer & Brunn.....	66,500	5,400	.....	.....	71,900
G. Amsinck & Co.....	38,300	3,700	14,500	1,200=	57,700
Johnstone, Whitworth & Co.....	45,400	.....	.....	.....	45,400
Robert Badenhop	16,500	.....	.....	.....	16,900
Total	1,099,500	135,500	273,100	131,200=	1,662,300

Plantation Rubber from the Far East.

EXPORTS OF CEYLON GROWN RUBBER.

(From January 1, to September 14, 1913 and 1914. Compiled by the Ceylon Chamber of Commerce.)

To—	1913.	1914.
Great Britain	8,809,508	11,947,217
United States	4,352,644	5,886,037
Belgium	2,478,057	2,969,369
Australia	367,309	482,674
Germany	176,626	1,037,417
Japan	170,889	215,100
Straits Settlements	48,343	42,535
Italy	38,828	1,772
Austria	29,335	.....
France	4,482	259,672
Holland	992	.....
India	881	1,050
Russia .....	.....	105,212
Total	16,477,894	22,948,053

(Same period 1912—8,240,392; same period, 1911—3,686,862.)

The export figures of rubber given in the above table include the imports re-exported. (These amount to 2,711,816 pounds 2,174,979 pounds from the Straits, and 525,213 pounds from India.) To arrive at the approximate quantity of Ceylon rubber exported to date, deduct the quantity of imports shown in the import table from the total exports.

TOTAL EXPORTS FROM MALAYA.

(From January 1 to dates named. Reported by Barlow & Co., Singapore. These figures include the production of the Federated Malay States, but not of Ceylon.)

To—	Singapore.	Malacca.	Penang.	Port Swet	Total
Great Britain.....	14,481,972	3,197,708	10,615,867	15,845,161	44,140,700
Continent	1,857,990	36,873	495,466	1,801,598	4,191,927
Japan	713,604	.....	.....	713,604	713,604
Ceylon	286,494	.....	664,933	1,007,374	1,958,801
United States	8,023,602	.....	595,333	136,590	8,755,525
Australia	56,457	.....	.....	.....	56,457
Total	25,420,119	3,234,581	12,371,599	18,790,723	59,817,022
Same period, 1913.	16,353,430	.....	8,222,533	18,716,169	43,292,132
Same period, 1912.	8,596,675	.....	4,798,834	12,353,409	25,748,918
Same period, 1911.	3,876,856	.....	2,577,465	6,795,266	13,249,587

*Corrected to July 31.

PARA RUBBER VIA EUROPE.

SEPT. 25.—By the <i>Adriatic</i> —Liverpool:	SEPT. 28.—By the <i>Philadelphia</i> —Liverpool:	OCT. 9.—By the <i>Celtic</i> —Liverpool:
Thompson & Co. (Fine).....	4,500	Johnstone, Whitworth & Co. (Fine).....
Johnstone, Whitworth & Co. (Fine).....	9,000	Johnstone, Whitworth & Co. (Coarse).....
Johnstone, Whitworth & Co. (Coarse).....	2,200	.....
Johnstone, Whitworth & Co. (Coarse).....	2,200	4,400

CENTRALS.

[*This sign, in connection with imports of Centrals, denotes Guayule rubber.]

SEPTEMBER 21.—By the *Mexico*—Mexico:

American Trading Co.....	2,500
Chit Bros.	1,000
SEPTEMBER 21. By the <i>Albania</i> —Colon:	5,100
Pablo Calvet & Co.....	3,900
A. M. Capen's Sons.....	1,900
Mcke & Co.....	1,500
J. S. Sembrada & Co.....	700
Camacho, Roldan & Van Sickle.....	4,300
Piza Nephews & Co.....	2,000
Harburger & Stack.....	500
J. Frank Dunbar.....	2,400
Wessels, Kulenkampff & Co.....	8,500
W. R. Grace & Co.....	24,000
Various	46,500
Total	101,300

SEPTEMBER 21. By the *Meln*—Tampico:

Madero Bros. Inc.....	*22,500
SEPTEMBER 24. By the <i>Magdalena</i> —Colon:	300
Caballero & Blanco.....	.....
SEPTEMBER 28. By the <i>Isle de Re</i> —Mexico:	1,500
Laurence Johnson & Co.....	.....
SEPTEMBER 28.—By the <i>Regencia</i> —Tampico:	23,500
Madero Bros. Inc.....	23,500
D. L. Bietzfeld & Bros.....	*1,500
SEPTEMBER 29. By the <i>C. de C.</i> —Colon:	4,000
G. Amsinck & Co.....	.....
C. E. Griffin & Co.....	1,500
Laurence Johnson & Co.....	8,500
Pablo, Calvet & Co.....	6,000
Strong & Trowbridge Co.....	7,000
Polanque Bros. & Co.....	600
Total	27,500

SEPTEMBER 29.—By the *Santa Marta*—Colombia:
R. Del Castillo..... 2,500

SEPTEMBER 29.—By the *Saramacca*—Puerto Cor-
rice:
Manhattan Rubber Mfg. Co..... 1,000
G. Amsinck & Co..... 500 1,500

SEPTEMBER 29.—By the *San Jose*—Port Limon:
Isaac Brandon & Bros..... 1,000

SEPTEMBER 29.—By the *Malinche*—Mexico:
H. Marquardt & Co., Inc..... 4,500

OCTOBER 5.—By the *Morro Castle*—Mexico:
H. Marquardt & Co., Inc..... 700
G. Amsinck & Co..... 300 1,000

OCTOBER 5.—By the *Matanzas*—Mexico:
Lawrence Johnson & Co..... 700

OCTOBER 5.—By the *Chelston*—Belize:
A. N. Rotholz..... 3,500

OCTOBER 5.—By the *Advance*—Colon:
Strong & Trowbridge Co..... 3,000
Various..... 4,500 7,500

OCTOBER 5.—By the *Japanese Prince*—Bahia:
Adolph Hirsch & Co..... 50,000

OCTOBER 5.—By the *Morro Castle*—Tampico:
Madero Bros., Inc..... *33,500

OCTOBER 8.—By the *Orotata*—Colon:
A. M. Capen's Sons..... 3,500
Fastmond & Co..... 20,500 24,000

OCTOBER 9.—By the *Zacapa*—Cartagena:
A. Held..... 4,000
G. Amsinck & Co..... 500 4,500

OCTOBER 10.—By the *Panama*—Colon:
G. Amsinck & Co..... 1,700
Wessels, Kulenkampff & Co..... 1,600
Camacho, Roldau & Van Sickle..... 1,200
J. S. Sembrada & Co..... 1,000 5,500

OCTOBER 13.—By the *Monterey*—Tampico:
Federico Nario..... *27,000

OCTOBER 14.—By the *Esparta*—Port Limon:
A. Held..... 1,000

OCTOBER 16.—By the *Asiatic Prince*—Bahia:
Adolph Hirsch & Co..... 22,500

OCTOBER 16.—By the *Mexico*—Tampico:
Madero Bros., Inc..... *33,500

OCTOBER 19.—By the *El Ouinto*—Galveston:
Various..... *20,000

OCTOBER 26.—By the *Esperanza*—Tampico:
Federico Nario..... *56,000
Madero Bros., Inc..... *56,000 *112,000

AFRICAN.

SEPTEMBER 22.—By the *Zeeland*—Liverpool:
Meyer & Brown..... 140,000
Arnold & Zeiss..... 22,500 162,500

SEPTEMBER 22.—By the *Minnewaska*—London:
Arnold & Zeiss..... 35,000

SEPTEMBER 24.—By the *Nite York*—Liverpool:
Rubber Trading Co..... 9,000

SEPTEMBER 27.—By the *African*—Liverpool:
Rubber Trading Co..... 40,000

SEPTEMBER 28.—By the *Philadelphia*—Liverpool:
General Rubber Co..... 4,500
Various..... 4,500 9,000

OCTOBER 2.—By the *Cedric*—Liverpool:
General Rubber Co..... 33,500
Meyer & Brown..... 2,000 35,500

OCTOBER 5.—By the *St. Louis*—Liverpool:
Henderson & Korn..... 2,000
Arnold & Zeiss..... 2,000 11,000

OCTOBER 5.—By the *Minnetonka*—London:
Aldens' Successors, Ltd..... 45,000

OCTOBER 8.—By the *Savannah*—Lisbon:
Arnold & Zeiss..... 26,000
Various..... 138,600 164,600

OCTOBER 9.—By the *Celtic*—Liverpool:
Ed. Maurer..... 11,200
Rubber Trading Co..... 4,500 15,700

OCTOBER 13.—By the *St. Paul*—Liverpool:
General Rubber Co..... 7,000
Various..... 17,500 24,500

OCTOBER 14.—By the *Marquette*—London:
Charles T. Wilson..... 45,000

OCTOBER 16.—By the *Californie*—Bordeaux:
Various..... 2,500

OCTOBER 16.—By the *Balta*—Liverpool:
Various..... 11,200

EAST INDIAN.

[*Denotes plantation rubber.]

SEPTEMBER 21.—By the *City of Norwich*—Col-
ombo:
Meyer & Brown..... *54,000
Rubber & Guayule Agency, Inc..... *63,000
Arnold & Zeiss..... *12,500
W. R. Grace & Co..... *12,500
Johnstone, Whitworth & Co..... *25,000
Robinson & Co..... *27,000
Ed. Maurer..... *30,000
Henderson & Korn..... *40,000
Various..... *100,000 *364,000

SEPTEMBER 21.—By the *St. Paul*—Liverpool:
Arnold & Zeiss..... *35,000

SEPTEMBER 22.—By the *Minnewaska*—London:
Meyer & Brown..... *95,000
Rubber & Guayule Agency, Inc..... *28,000
General Rubber Co..... *180,000
Michelin Tire Co..... *22,500
Johnstone, Whitworth & Co..... *25,000
Earle Bros..... *2,200
General Electric Co..... *16,000
H. A. Astlett & Co..... *5,600
Ed. Maurer..... *70,000
Robinson & Co..... *44,500
Henderson & Korn..... *67,000
Charles T. Wilson..... *190,000
Head Rubber Co..... *33,600
Rumsey & Greutert Co., Inc..... *33,500
Arnold & Zeiss..... *108,000
L. Littlejohn & Co..... *50,000
Henderson & Korn..... *47,000
Various..... *410,000 *1,439,900

SEPTEMBER 22.—By the *Zeeland*—Liverpool:
Meyer & Brown..... *16,500
Various..... *11,200
Arnold & Zeiss..... *112,000 *139,700

SEPTEMBER 24.—By the *Chicago*—Havre:
Various..... *13,500

SEPTEMBER 28.—By the *Minnehaha*—London:
Meyer & Brown..... *26,000
Otto Iserstein..... *95,000
General Rubber Co..... *110,000
Ed. Maurer..... *65,000
L. Littlejohn & Co..... *22,500
Henderson & Korn..... *86,500
Robinson & Co..... *25,000
Mittald, Cappel & Co..... *3,500
Arnold & Zeiss..... *120,000
Rubber Trading Co..... *4,500
Charles T. Wilson..... *125,000
Johnstone, Whitworth & Co..... *46,000
Various..... *310,000 *1,039,000

SEPTEMBER 30.—By the *Indra*—Singapore:
Meyer & Brown..... *35,000
Arnold & Zeiss..... *75,000
The B. F. Goodrich Co..... *260,000
Ed. Maurer..... *33,500
Johnstone, Whitworth & Co..... *105,000
Henderson & Korn..... *47,500
L. Littlejohn & Co..... *100,000
Ed. Boustead & Co..... *11,200
Ed. Maurer & Co..... *12,500
Various..... *400,000 *1,074,700

OCTOBER 2.—By the *Cedric*—Liverpool:
Rumsey & Greutert Co., Inc..... *33,500

OCTOBER 5.—By the *Minnetonka*—London:
General Rubber Co..... *50,000
Johnstone, Whitworth & Co..... *38,000
Earle Bros..... *2,200
Robinson & Co..... *22,500
L. Littlejohn & Co..... *200,000
Ed. Maurer..... *40,000
Charles T. Wilson..... *100,000
The B. F. Goodrich Co..... *560,000
Various..... *95,000 *1,107,700

OCTOBER 9.—By the *Kroonland*—Liverpool:
Various..... *45,000

OCTOBER 9.—By the *Celtic*—Liverpool:
Rumsey & Greutert Co., Inc..... *35,000
Johnstone, Whitworth & Co..... *1,100 *36,100

OCTOBER 13.—By the *St. Paul*—Liverpool:
Various..... *30,000

OCTOBER 14.—By the *Samland*—London:
Arnold & Zeiss..... *11,200
Henderson & Korn..... *8,000
Charles T. Wilson..... *90,000
Ed. Maurer..... *16,000
Rumsey & Greutert Co., Inc..... *22,500
Johnstone, Whitworth & Co..... *4,500
Meyer & Brown..... *2,200
Various..... *13,500 *167,900

OCTOBER 14.—By the *Marquette*—London:
Rubber & Guayule Agency, Inc..... *22,500
Robinson & Co..... *36,000
Ed. Maurer..... *180,000
L. Littlejohn & Co..... *105,000
Henderson & Korn..... *135,000
General Rubber Co..... *190,000
Johnstone, Whitworth & Co..... *90,000
Arnold & Zeiss..... *45,000
Otto Iserstein..... *11,200
Charles T. Wilson..... *25,000
Various..... *465,000 *1,304,700

OCTOBER 16.—By the *City of Durham*—Colombo:
Henderson & Korn..... *30,000
Robinson & Co..... *30,000
Johnstone, Whitworth & Co..... *80,000
C. W. Mackie..... *30,000
Rumsey & Greutert Co., Inc..... *7,000
Rubber & Guayule Agency, Inc..... *7,000
Meyer & Brown..... *132,000
Various..... *25,000 *347,000

OCTOBER 19.—By the *Minnewaska*—London:
Meyer & Brown..... *14,500
Rubber Trading Co..... *8,000
Henderson & Korn..... *32,000
Arnold & Zeiss..... *4,500
Ed. Maurer..... *110,000
Johnstone, Whitworth & Co..... *65,000
Charles T. Wilson..... *85,000
Robert Badenhop..... *3,000
Rubber & Guayule Agency, Inc..... *7,000
Robinson & Co..... *7,000
General Rubber Co..... *350,000
L. Littlejohn & Co..... *65,000
Rumsey & Greutert Co., Inc..... *11,200
The B. F. Goodrich Co..... *250,000
Various..... *335,000 *1,347,200

OCTOBER 23.—By the *Indrakula*—Singapore:
Meyer & Brown..... *51,500
Arnold & Zeiss..... *67,000
L. Littlejohn & Co..... *56,000
Ed. Boustead & Co..... *45,000
Henderson & Korn..... *130,000
Johnstone, Whitworth & Co..... *20,000
W. Stiles..... *16,000
Ed. Maurer..... *22,500
Various..... *265,000 *673,000

OCTOBER 26.—By the *Kafne*—Colombo:
Meyer & Brown..... *190,400
Rubber & Guayule Agency, Inc..... *25,000
Henderson & Korn..... *13,500
Various..... *130,000 *358,900

OCTOBER 26.—By the *Philadelphia*—Liverpool:
Aldens' Successors, Ltd..... *20,000

OCTOBER 26.—By the *Minnehaha*—Liverpool:
Aldens' Successors, Ltd..... *8,000

CUSTOM HOUSE STATISTICS.

PORT OF NEW YORK—SEPTEMBER, 1914.

Imports	Pounds.	Value.
India rubber.....	13,827,986	\$6,607,840
Balata.....	315,215	149,758
Guayule.....	181,276	40,882
Gutta percha.....	36,493	6,488
Gutta jelutong (Pontianak).....	471,079	19,184
Total.....	14,832,049	\$6,824,152

Exports	Pounds.	Value.
India rubber.....	169,127	\$109,244
Balata.....	98,103	50,687
Rubber scrap, imported.....	393,661	29,046
Rubber scrap, exported.....	169,507	14,153

BOSTON IMPORTS IN SEPTEMBER, 1914.

	Pounds.	Value.
India rubber.....	236,708	\$118,271
Gutta percha.....	65,960	10,420
Gutta jelutong.....	764,057	49,439

THE RUBBER SCRAP MARKET.

At the beginning of the month of October dealers were operating to a fairly large extent in boots and shoes at 6½ to 6¾ cents. Mills were not large purchasers, but were paying 7 cents for their requirements, while in some cases they paid 7½; some sales being reported even at 7¼ cents under special circumstances.

By the middle of the month a somewhat better tone prevailed, large dealers being willing to give about 6¾ cents, and the business with mills being done at 7½ to 7¾ cents. Some dealers claimed to have been able to buy under 6½ cents, but any such transactions did not affect the market generally.

Towards the close of the month a slightly less active tone prevailed; mills offering only 7 cents, but being obliged in some cases to pay 7¼ cents. Some dealers, who were desirous of reducing stock, sold at 7 cents.

Auto. tires were weak at the opening of the month, buyers only operating to a limited extent, but paying 4½ cents. Dealers were not disposed to pay over 4¼ cents. Later in the month, mixed lots of tires were sold by dealers at 4½ to 4¾ cents, while reclaimers needing a special grade were disposed to pay good prices. Dealers could not purchase tires at prices allowing of sales under 4½ cents. In the closing week they were able to buy at 4½ cents.

Sales of inner tubes between dealers were effected, it is said, for No. 1 at 20 cents, while the best price consumers were willing to pay was 22 to 23 cents. For No. 2 dealers were not disposed to offer more than 10½ to 11 cents. For boots and shoes large Philadelphia dealers are offering to collectors 6½ and selling to reclaimers at 7 cents. The prices offered for mechanical rubber scrap have been speculative, owing to uncertainty as to disposal of the merchandise.

At Boston dealers obtained for boots and shoes from 7 to 7¼ cents, paying 6½ to 6¾ cents. Auto, tires and inner tubes are depressed, owing to lack of demand.

RUBBER SCRAP PRICES PAID BY CONSUMERS FOR CARLOAD LOTS.

New York, October 30, 1914.

Per Pound.

Boots and shoes.....	cents	6¼@ 7
Trimmed arctics.....		4½@ 4¾
Automobile tires.....		4¾@ 4½
Solid tires.....		4¼@
No. 1 inner tubes.....		21 @ 22
No. 2 inner tubes.....		11½@ 12½
Red tubes.....		13 @ 13½
Bicycle tires.....		2¾@ 3
Irony tires.....		1¾@ 2¼
Mixed auto. peelings.....		6¾@ 7
No. 1 auto. peelings.....		8¼@ 9¼
Mixed white scrap.....		7¼@ 7¾
No. 1 white scrap.....		10¼@ 10¾
No. 1 soft white rubber.....		10¼@
White wringer rubber.....		6¼@
No. 1 red scrap.....		9¼@
Mixed red scrap.....		6¼@
Mixed black scrap.....		2¼@
Rubber car springs.....		3¼@
Horse shoe pads.....		2¼@ 2¾
Matting and packing.....		1¼@ 1½
Garden hose.....		5¼@
Air brake hose.....		2¾@
Cotton fire hose.....		1¾@

The Leicester Rubber Co., of Catasauqua, Pennsylvania, has been petitioned into bankruptcy, with liabilities of \$49,716 and assets of \$28,560. This company, which purchased cheaper grades of scrap rubber, was formerly located at Trenton, New Jersey, moving to Catasauqua about a year ago. Its plant was destroyed by fire on July 19.

FORMER JUNK CLASSIFICATION RESTORED

The National Association of Waste Material Dealers has been instrumental in the restoration of the railroad classification of junk. New provisions will be incorporated in classification No. 53, which will deal with scrap rubber, including worn out rubber tires. Much appreciation has been expressed of the efforts so successfully made by the Western Traffic Committee of the above association, in the interest of the trade, for revisions of classifications and rates. The committee includes Albert Birkenstein, of S. Birkenstein & Sons, Chicago, and Ed. Friedlander, of the Loewenthal Co.'s Chicago office.

The committee appointed by the National Association of Waste Material Dealers met at Chicago on October 8, to discuss recommendations to be made to the Felt Makers' Association. These will be dealt with at the next meeting of the felt manufacturers. Messrs. Louis and Milton Birkenstein, of S. Birkenstein & Sons; S. Kahn, of M. Kaufman, and Milton Loewenthal, of the Loewenthal Co., formed the committee.

PANAMA SCRAP HOSE.

A further sale of scrap hose by the Panama Canal Commission took place on October 19, when the following were among the successful bidders: S. Birkenstein & Sons, 10,151 lbs. air and signal hose, 291c.; H. Muehlstein & Co., 19,551 lbs. steam, water and pneumatic hose, 45c. per cwt.; The Loewenthal Co., 8,611 lbs. fire and washout hose, etc., 1.87½c.; Atlantic Manufacturing Co., Wilmington, 4,332 lbs. sleeves, 1½c.; Oppenheimer & Co., 18,819 lbs. armored and wire-inserted hose, 20c., and The Loewenthal Co., 9,100 lbs. suction hose, 30c.

Complaints have been received of Chinese rubber shoes having been offered to members of the waste trade at the regular prices current for American shoes. As the value of these Chinese shoes is understood to be about 1c. per pound, cautious investigation is recommended of any such offers.

The incorporation has been announced of B. Levi & Co., waste material dealers, at Scranton, Pennsylvania, with a capital stock of \$20,000. It is stated that the incorporators are David Levi, Rica Levi and L. L. J. Levi.

REAR SIGNAL IN TURNING OR STOPPING AUTOMOBILES.

The old-time method of stretching out the hand to indicate that the driver of an automobile is about to turn in one direction or the other or to stop his car is likely to be displaced by an automatic rear signal lamp, as shown in the cut herewith. This lamp consists of three small bulbs mounted in a black finished aluminium base, each unit being made up of a vulcanized rubber socket containing a specially made tungsten bulb and reflector. These bulbs are said to consume only about one-third the amount of current needed for the standard lighting equipment and may be operated on dry batteries if desired. The signals are operated by self-contained waterproof contact devices attached to the steering gear and clutch pedal. The turning of the steering wheel to the right or left automatically moves an arrow in the corresponding lamp, indicating in which direction the car will proceed, and the throwing out of the clutch which precedes stopping causes the word "Stop" to appear in red letters in the center lamp. [H. W. Johns-Manville Co., New York.]





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November 1, 1914.

No. 2.

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NEW YORK CHEMICAL QUOTATIONS.

October 30, 1914.

Aluminum flake.....	lb.	1.30	@	
Antimony, crimson, sulphuret of.....	lb.	.33	@	.39
Antimony, golden, sulphuret of.....	lb.	.25	@	.28
Arsenic sulphide.....	lb.	.12	@	
Asbestine.....	ton	\$16.00	@	\$18.00
Barytes, carbonate domestic.....	ton	21.35	@	
Barytes, carbonate, imported.....	ton	19.00	@	23.00
Barytes, carbonate, domestic.....	ton	17.00	@	19.00
Beeswax, crude yellow.....	lb.	.30	@	.32
Benzol 90 per cent.....	lb.	.30	@	
Black hypo.....	lb.	.26	@	
Blanc fixe.....	lb.	.0378	@	
Cadmium yellow.....	lb.	1.25	@	1.50
Carbon bi-sulphide.....	lb.	.92	@	.12
Carbon tetra-chloride, drums.....	lb.	.14	@	.16
Ceresin wax, white.....	lb.	.15	@	.25
China clay, domestic.....	ton	8.00	@	9.00
Coal tar naphtha.....	gal.	.28	@	
Fossil flour.....	ton	35.00	@	
Glycerine, C. P., bulk.....	lb.	.24	@	.25
Graphite.....	lb.	.40	@	.60
Green oxide of chromium.....	lb.	.35	@	
Iron oxide.....	lb.	.02	@	.10
Infusorial earth.....	ton	35.00	@	
Lampblack.....	lb.	.034	@	.07
Lead, sublimed white.....	lb.	.07	@	
Lead, white (basic carbonate).....	lb.	.05	@	.05 1/4
Lead, white (basic sulphate).....	lb.	.04 3/4	@	.05
Linseed oil, carload.....	gal.	.44	@	
Litharge.....	lb.	.05	@	.05 1/4
Lithopone, American.....	lb.	.03 3/4	@	.04
Magnesia, calcined, domestic.....	ton	28.50	@	29.50
Magnesite, calcined, powder.....	ton	30.00	@	35.00
Naphtha, V. M. & P., deodorized.....	gal.	.09	@	
Naphtha, 70 deg.....	gal.	.23	@	
Naphtha, 76 deg.....	gal.	.26	@	
Orange mineral, domestic.....	lb.	.07 1/2	@	.08 1/2
Ozokerite, refined yellow.....	lb.	.25	@	.30
Paraffine wax, domestic 120 m. p.....	lb.	.04 1/2	@	.04 3/4
Pumice stone, powder.....	lb.	.01 1/2	@	.02
Prussian blue.....	lb.	.46	@	.48
Rape seed oil, blown.....	gal.	.78	@	.80
Red oxide, domestic.....	lb.	.05 1/2	@	.6
Rosin oil.....	gal.	.25	@	
Shellac, fine orange.....	lb.	.16	@	.18
Soapstone, powdered.....	ton	10.00	@	12.00
Sulphur chloride, in drums.....	lb.	.7 1/2	@	.08
Talc, American.....	ton	10.00	@	20.00
Ultramarine blue.....	lb.	.03 1/2	@	.13
Vermilion Chinese.....	lb.	.90	@	1.00
Whiting, commercial.....	cwt.	.55	@	
Whiting, Paris white.....	cwt.	.75	@	
Whiting, English cliffstone.....	cwt.	1.00	@	
Zinc oxide, American process.....	lb.	.05 3/8	@	
Zinc oxide, French process, red seal.....	lb.	.07	@	
Zinc oxide, French process, green seal.....	lb.	.07 1/2	@	
Zinc oxide, French process, white seal.....	lb.	.08	@	

ENGLISH INQUIRY FOR CARBON TETRA-CHLORIDE.

In an inquiry which recently appeared in an English publication for carbon tetra-chloride this statement was made: "Up to the present time we understand that the manufacture of this commodity has been exclusively confined to Germany."

As a matter of fact there has been a flourishing American industry in this line for more than ten years. It is a by-product of the electrolytic decomposition of salt, which is a large industry in this country.

BATAVIA RUBBER EXHIBITION

The "Ceylon Observer" of September 4 states that on September 3 a telegram was received by Kelway Bamber in that city from the Commissioner-General of the Batavia Rubber Exhibition, which said: "Opening 19th October."

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ought to be? Probably I can
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Vol. LI. No. 3.

DECEMBER 1, 1914.

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Crude Rubber and Compounding Ingredients

A TEXT BOOK OF RUBBER MANUFACTURE

By **HENRY C. PEARSON**

Editor of *The India Rubber World*

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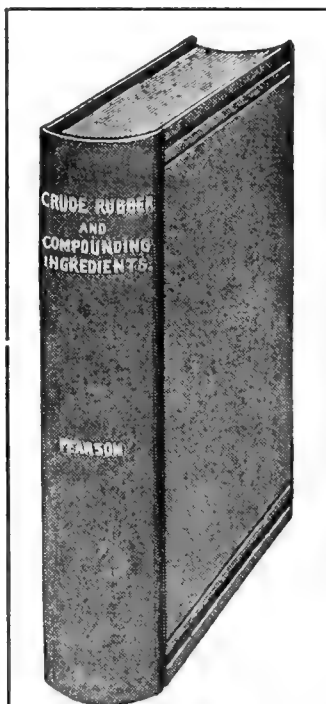
[With Condensed Titles of Chapters.]

- I.—Grades of Crude Rubber; Physical Characteristics.
- II.—Some Little Known Rubbers and Pseudo Gums.
- III.—Primary Processes—Washing, Mixing and Calendering.
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- VI.—Substitutes for India-rubber and Gutta-percha.
- VII.—Reclaimed Rubber and Its Uses.
- VIII.—Resins, Balsams, and Waxes used in Compounding.
- IX.—Coloring Matters.
- X.—Acids, Alkalis, and Their Derivatives.
- XI.—Vegetable, Mineral, and Animal Oils.
- XII.—Solvents used in India-rubber Proofing and Cementing and in Commercial Cements.
- XIII.—Miscellaneous Processes and Compounds, including Waterproofing Compounds.
- XIV.—Physical Tests and Methods of Analysis of Crude Rubber and Vulcanized Rubber.
- XV.—Gutta-percha.

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Published on the 1st of each Month by

THE INDIA RUBBER PUBLISHING CO.

No. 25 West 45th Street, New York.

CABLE ADDRESS: IRWORLD, NEW YORK.

HENRY C. PEARSON, Editor

Vol. 51.

DECEMBER 1, 1914.

No. 3

SUBSCRIPTIONS: \$3.00 per year, \$1.75 for six months, postpaid, for the United States and dependencies and Mexico. To the Dominion of Canada and all other countries, \$3.50 (or equivalent funds) per year, postpaid.

ADVERTISING: Rates will be made known on application.

REMITTANCES: Should always be made by bank draft or Postoffice or Express money order on New York, payable to THE INDIA RUBBER PUBLISHING COMPANY. Remittances for foreign subscriptions should be sent by International Postal Order, payable as above.

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Entered at the New York postoffice as mail matter of the second class.

TABLE OF CONTENTS ON LAST PAGE OF READING.**THE NEW FEDERAL RESERVE BANKING SYSTEM.**

THE Federal Reserve banking system which, after many months of preparatory work, was put into operation November 16, marks the greatest change in our financial methods since the establishment of the National bank system over fifty years ago. Briefly, this new banking scheme will substitute commercial credits in the place of government bonds as a basis for bank issues. The old system now being displaced was exceedingly inelastic; under it there was too little currency when it was most needed and too much when it was not necessary. It is confidently believed by financiers generally that the new method will prove a remedy for this condition. When business is active the new reserve notes will be issued against sound commercial credits, and when business activity subsides and credit is no longer needed in the same volume, these bank notes will be deposited in the bank and retired.

It is believed that under this new system of banking the annual stringency caused by the necessity of funds for moving the western crops will be avoided and, better than

that, that the panics which have recurred from time to time, and which have played such havoc with American business, will be averted.

The new system will not provide funds for building operations, for enlargement and equipment of factories, but will simply be supplied to those who are handling commodities which can easily and immediately be converted into cash.

One feature of the new Reserve Bank system which will be of particular interest to those engaged in foreign trade is that part of the act which permits national banks to deal in foreign acceptances. For instance, if an American manufacturer wants to purchase material in a foreign country he arranges with a bank engaged in international operations to draw the necessary funds. The bank then stamps this draft "Accepted," thereupon becoming responsible for its payment. This acceptance, consequently, is good in any part of the world where the bank has credit. And, vice versa, if a foreigner wishes to purchase American goods he applies to the international bank in his city for a similar acceptance. This significant expansion of the financial operations of our banks, together with the establishment of branches of leading North American banks in South American cities, must greatly facilitate commerce between these two continents. No longer will there be any excuse for carrying on trade between North and South America by the circuitous and expensive European route.

ENGLAND'S RUBBER EMBARGO.

THAT there is a substratum of uneasiness on the part of American manufacturers because of the embargo is evident. Their visits to Washington and letters and telegrams to the State Department prove it. Yet there is a decided vein of optimism evident also. That England intends to stop rubber from going to Germany or Austria they believe. That a stoppage of shipments to the United States would help goes without saying. Perhaps, and probably, a bit later shipments could be resumed under such guarantees as would convince England that the United States was to be the ultimate destination. Again, with the Suez canal threatened, England may wish to stock up while she can. If the war goes on she and France will need lots of rubber for tires, ground sheets, etc. A big stock of rubber in London or Liverpool is only a common sense safeguard. Once accumulated, shipments to the United States would undoubtedly be resumed.

The view of some that England is going to effect a corner on plantation rubber and boost the price is too weird to be considered. It isn't the way she does things. Besides, the United States is too good a customer to treat in any such fashion. So taking it all in all, the confident belief is that there will be plenty of rubber and that there will not be any great increase in price.

DRY AND WET SEASON PLANTATION RUBBER.

FOR some time past an American rubber factory has been testing the tensile strength of rubber from an Eastern plantation in which it has an interest. One result has been the discovery that rubber gathered in the dry season has twenty-five per cent. more tensile strength than rubber from the same trees gathered in the wet season. If this is found to be the case generally there will in time be two added grades to plantation sorts, i. e.—Wet and Dry Season.

THE FAR EAST KNOCKING AT OUR DOORS.

UNDOUBTEDLY one strong actuating influence which has moved the English to put an embargo on the shipment of rubber from their Eastern colonies to American ports is the fear that Eastern rubber might get the habit. It is obviously to the advantage both of the Eastern planters and of American manufacturers that rubber should be shipped direct from one to the other, but it is equally obvious that this method would not be looked upon with favor by rubber circles in London.

But while direct shipments may not take place, at least from British colonies, during the war, it is quite probable that they will follow its conclusion, for the East is exceedingly anxious to get into direct touch with the largest consumer of its plantation product. Interesting light is thrown on the Eastern attitude by two letters which appear on another page in this issue. One comes from a firm of Rotterdam dealers who market the rubber from a number of Dutch estates in Java and Sumatra. They ask for information as to the best way to get in contact with American customers. They write: "We have gone so far as to suggest the idea of establishing an office in the United States for joint account of our companies to sell our product there; and we have considered the possibility that the Americans might work hand in hand with us to open a market in your country direct, instead of taking the way via England."

The other letter comes from a correspondent who has contributed before to the columns of this publication and

who has long been familiar with conditions in the East. "There is now the chance of a lifetime," he says, "for American firms to buy rubber direct here in Singapore, and to establish direct relations with the center of production. Rubber was selling here in August at 1s. to 1s. 6d. per lb.—prime smoked sheet—but no orders could be obtained from anywhere. Where were your manufacturers? If they had had agents here they would have had the chance of a lifetime to lay in stocks on the ground floor."

It is not characteristic of American manufacturers to continue the long way around when there is a short cut in plain sight, and there is not likely to be an indefinite continuance of the system by which Eastern rubber intended for New York must first go somewhere else, some distance out of its way, with no other result than that its receipt is materially delayed and its cost considerably increased.

THE RUBBER CLUB'S RELIEF FUND.

THE relief fund being raised by the Rubber Club of America for the assistance of the Red Cross work and for the succor of the Belgian victims of the war, had on November 25 reached nearly \$2,000. This sum will undoubtedly grow considerably during the present month. A more extended reference will be found on another page to the club's appeal to its members and their response. It will be noticed there that, while perhaps a majority of the members contributed to the fund the sum that would normally have been paid for attendance at the usual annual banquet, quite a good many others gave contributions far in excess of this sum—many sending in contributions of \$25, some of \$50, and some exceeding \$100. This is an excellent showing in view of the fact that appeals for the Red Cross work and for the Belgian sufferers have been made from many quarters during the last few weeks and without doubt a large number of the club members had already made substantial contributions to these causes through other channels.

ONE PITFALL THE EXPORTERS SHOULD AVOID.

THE opening door of the South American market—which will be likely to open wider with the continuance of the war—will undoubtedly attract not a few American manufacturers, and among them makers of various rubber goods. Their success in this field will be in proportion to the discretion with which it is entered.

The difficulties in the way of inaugurating profitable

trade relations with the republics to the south—difficulties in financing, in the commercial traditions and customs of the South Americans and in their national and racial differences from ourselves—have been discussed at considerable length in these columns. But there is one pitfall that has trapped unwary exporters in the past, and which will undoubtedly continue to claim still further victims, that can easily be avoided.

Under the laws of most of the South American republics a trade mark becomes the property of the man who first enters it for registry, without any regard whatever to the ownership of the goods on which the trade mark appears or the length of time it may have been in use. To illustrate,—If an American manufacturer, after a great expenditure of time and money and effort, succeeds in getting a market for his goods, let us say in Argentina, and the Argentine dealer to whom he entrusts the distribution of his merchandise—or, as a matter of fact, any other dealer—registers the trade mark, he can effectually estop the American manufacturer from marketing his goods in that country through any other agent than himself. This is not a theoretical situation, for it has occurred in a number of instances.

Once this pitfall is seen, the remedy is of course simple, namely,—that the American manufacturer, before he enters into any trade relations in any South American country, should register his trade mark in that country in his own name and avoid the anomalous and most unhappy position of being the owner of the goods but having the trade mark of these goods, and with it the absolute control of their sale, fall into alien and often hostile hands.

WHAT THE LOSERS WILL HAVE TO PAY.

WHETHER the end comes soon or late, of the most stupendous war the world has ever seen, somebody will have to pay. It is not going to end in a love feast and embraces all around. The governments and peoples in this struggle are grimly in earnest, and when the loser sits down at the council table with the plenipotentiaries of the victors he must prepare himself for some very unpalatable demands. The material losses of all contestants have been stupendous and, whatever the loser or neutrals may say, the victor will not be backward in demanding compensation.

Passing considerations of money indemnities and changes in the map of Europe, the question of interest to readers of *THE INDIA RUBBER WORLD* is what is going to be done about the colonies of the warring nations.

One thing is extremely probable. If Germany wins, she will possess every foot of Africa from the Strait of Gibraltar to the Cape of Good Hope. With England, France and Belgium she is at war. Italy must be punished for her failure to maintain the Triple Alliance and Portugal for her announced readiness to support England when called upon. This accounts for all but Spain's insignificant possessions and the little states of Liberia and Abyssinia, which would wait their turn with such equanimity as might be possible. It is not likely that Germany would care for an Indian problem just yet.

On the other hand, if Germany loses she is likely to be stripped of every foot of her possessions outside of Europe, and they would be divided, of course, between France and England. Kaiuchau, on the coast of China, which Japan lately captured from Germany, will, no doubt, be returned to its original owner, if Germany is defeated. But if the latter wins, Japan will come in for a bad quarter of an hour, in which China will share. An even more momentous question would arise for the United States if Germany should win and should demand possession of some or all of the West Indian possessions of England and France. The Monroe Doctrine would require the United States to oppose the coming of another strong European power as a neighbor. But Germany does not recognize the Monroe Doctrine and a highly interesting situation would arise.

THE INCORPORATION IN THE EASTERN STATES OF NEW companies having a capital of one million dollars or over represented for the month of September an aggregate capitalization of fifty-four million dollars. This was an increase of four million over August and of twelve million over September of a year ago, but it is materially below the average for the last three years. For the twelve months of 1912 and for the first five months of 1913 the monthly capitalization of new corporations only twice fell below the one hundred and fifty million mark, the average being well over two hundred million dollars a month. There was a marked falling off in June of 1913 and only twice since that time has the monthly aggregate exceeded one hundred million.

For the first nine months of the present year the total capitalization of new corporations of a million and over in the eastern states was six hundred and seventy-two million dollars, which is but slightly over one-half of the amount for the same period in the preceding year and not much over one-third of the aggregate for the same period in 1912. The new capitalization during the present year has averaged a little less than seventy-five million dollars per month, which, though low in comparison with recent years, is undoubtedly quite high enough to harmonize with present conditions.

Belgium and Its Rubber Trade.

HOWEVER opinions may differ among Americans in regard to the motives and merits of the great European conflict—though probably American opinions differ very

little there is one phase of the situation regarding which there is no difference of opinion, and that is the pitiful estate of Belgium, which, at peace with all its neighbors and without any quarrel in any part of the world, has been ground between the upper and the nether millstone and brought into a condition of almost total ruin.

It is hardly necessary to draw any picture here of the universal distress and misery prevailing in that unhappy Kingdom, as the daily press has done this work very thoroughly during the last three months and every tourist who has returned to these shores from any part of Belgium has added to the sad recital. Practically all the able-bodied men among Belgium's population of seven and a half million people have been drafted into service, and the women and children who are left behind, many of them, can find shelter only in the debris of their former homes and have little to subsist upon except the hope of relief from America's generous contributions.

Practically all industries in Belgium, for the time being, have been destroyed, except such as may be turned into military channels. The rubber industry is no exception. As an illustration of its present condition the case of the

Englebert company, of Liege, might be cited, whose New York representative states that nothing has been heard from the factory since the German bombardment, but through other channels it has been known that this factory, which before the opening of hostilities was engaged in making tires, tubes, tennis balls, mechanical goods and druggists' sundries, has been

seized by the Germans and is employed in the manufacture of tires for the Kaiser's military motors. Accurate news from

the other rubber manufacturers in Belgium is difficult to obtain, but it is quite safe to say that none of them are operating except those that are being operated for military purposes.

The rubber industry in Belgium was in a prosperous condition up to the first of August, when the Germans invaded that Kingdom. Belgian rubber manufacture began as far back as 1852, which was only a few years later than the beginning of rubber manufacture in the United States. In that year a factory was established at Molenbeek St. Jean by Gustave Luyckx, of Brussels. A very interesting phase of Belgian rubber history lies in the fact that the second factory to be established in that country—which began operations in the late 50's—was founded by an American, and quite a remarkable American, Jonathan Gage Stickney, who was born in Beverly, Massachusetts, in 1819, became associated with Samuel Colt, the inventor of the Colt revolver and an uncle of the present president of the United States Rubber Co. About the middle of the last century Mr. Stickney went to Europe to establish factories for the manufacture of the Colt firearms, but through some misunderstanding with his American principals, he left their employ and took a pleasure trip to Paris, where he fell in with Charles Goodyear, then

making his famous rubber exhibit at the Paris Exposition. Stickney at once saw the possibilities in this new industry and under

Goodyear's direction erected a factory in France for rubber manufacture. Soon after, about 1859, he built a second rubber factory, this time locating at Menin, Belgium, only a few miles southeast of Ypres, which has figured so conspicuously in the present war. He not only erected the building but he built his own washers, mixers and calenders and all the rubber machinery, and he did

it so well that it was still in active operation in the same mill 50 years later.



KING ALBERT OF BELGIUM



RECEIVING RUBBER AT ANTWERP.

Since those early days the number of rubber factories in Belgium and its general interest in this line of manufacture have steadily increased, so that it has at present, or, more properly, had before the opening of the European conflict, 12 considerable factories, 3 in Brussels, 3 in Liège, one of them the plant of Englebert & Cie referred to above, 1 in Ghent, the Colonial Rubber Co., Limited, 4 in Malmédy.



EXAMINING RUBBER AT THE ANTWERP MARKET.

cluding the Michael-Jackson Co. and Defauw Freres, and one in Alost.

These factories turned out a great variety of rubber goods, including hard rubber products and, latterly, rubber footwear.

In addition to the companies mentioned above there are two others which for several years past have been engaged in the reclaiming of rubber, and there were many other small work shops making rubber stamps and waterproofing clothing, bringing the list of Belgian rubber factories, all told, probably up to thirty. It is safe to say that at least 4,000 workmen were engaged in the different Belgian rubber factories before these works were compelled to close down.

The enterprise of the Belgian rubber people was shown to a marked extent by the very fine exhibit they made at the rubber show held in New York in the fall of 1912, their display including some 85 classified rubber samples, provided by the Antwerp Chamber of Commerce. Their exhibit at the London rubber exposition held last July was notable. It was referred to in the August number of THE INDIA RUBBER WORLD as follows:

"Numberless pages might be devoted to this exhibit without approach to justice in the description. It is doubtful if anything more beautiful, more comprehensive in its character or more informing generally than this Belgian exhibit has ever been seen at a commercial show. Perhaps some idea of its size may be conveyed to those who have visited Agricultural Hall by the statement that this Belgian exhibit filled the entire entrance as well as King George's Hall; and possibly the pictures here shown, may afford some slight idea of its character."

But probably to the American trade the most interesting

phase of the rubber industry in Belgium is the crude rubber market, situated at Antwerp. It would be very interesting, if there were space, to describe the development of Antwerp as a shipping port, but it can only be mentioned here that the authorities of the city intended to create at Antwerp the largest harbor in the world and up to 1909 had spent \$45,000,000 to effect this purpose, with the expectation of spending over \$50,000,000 more, hoping to complete the work by 1920. While the number of vessels docking at Antwerp in the years 1911 and 1912 was not much over one-third of those entering the port of Hamburg, the Antwerp tonnage for these two years exceeded the Hamburg tonnage. But the one feature of Antwerp commerce of interest to the readers of this paper is its commerce in crude rubber. Its imports of this article increased during the last 20 years from 724 tons to 7,703 tons. Here is a table giving the annual imports for the last 21 years:

The Imports of Crude Rubber at Antwerp from 1893 to 1913.					
1893	.....tons	724	1900	.....tons	5,698
1894	.....	1,393	1901	.....	5,849
1895	.....	1,406	1902	.....	5,403
1896	.....	1,115	1903	.....	5,726
1897	.....	1,679	1904	.....	5,763
1898	.....	2,014	1905	.....	5,713
1899	.....	3,402	1906	.....	5,772
			1907	.....tons	5,054
			1908	.....	5,035
			1909	.....	4,685
			1910	.....	4,058
			1911	.....	4,335
			1912	.....	4,777
			1913	.....	7,703

Ten to fifteen years ago nearly all the rubber imported into Antwerp came from the Congo Free State. For instance, of the total in 1901—5,849 tons—5,417 tons was Congo rubber and only 432 tons came from other sources. But during the last few years Antwerp has received increasing quantities of rubber from the Belgian plantations in the Far East. The table given below showing all the sources of Belgium rubber importations for the last three years will be found interesting:



SECTION OF THE BELGIAN EXHIBIT AT THE LONDON RUBBER EXHIBITION.

Imports of Crude Rubber into Belgium for 1911-12-13 and the Chief Sources of Supply

From	1911	1912	1913
Belgian Congo	4,020	4,530	3,590
Ceylon		1,080	2,288
Straits Settlements	857	495	505
British Indies		47	87

United States	529	523	318
France	1,326	1,171	949
Great Britain	1,550	2,001	3,035
Netherlands	735	1,119	1,361
Other countries	2,168	2,704	2,512
Total	11,185	13,670	14,745



PLANT OF ENGLEBERT & CIE.

A comparatively small percentage—ranging from 20 to 25 per cent of the Belgian rubber imports represents Belgian consumption, the remainder being distributed to various points. This distribution for the last three years is shown in the following table:

Exports of Crude Rubber from Belgium During the Last Three Years and Principle Points of Destination.

To	1911	1912	1913
Germany	1,458	1,623	1,919
United States	2,651	2,726	2,775
France	1,045	1,455	1,058
Great Britain	917	801	717
Hamburg	1,064	906	783
Netherlands	680	1,011	1,176
Russia	1,021	1,899	2,091
Other countries	331	741	572
Total	9,167	11,162	11,091
Total imports	11,185	13,670	14,745
Total exports	9,167	11,162	11,091
Belgian consumption	2,018	2,508	3,654



ENTRANCE TO BELGIAN EXHIBIT AT THE LONDON RUBBER EXHIBITION.

It will be noticed from the table of imports above that Belgian rubber imports from the Far East have increased

rapidly during the last three years, amounting in 1913 to 2,980 tons, as compared with 857 tons two years earlier. The greater part of this rubber came from the estates established by Belgium in Malaya, Java and Sumatra. But the story of rubber importations in Belgium during the last thirty years has to do chiefly, in fact almost entirely, with the Belgian Congo.

The first authentic information on the Congo country was given to the world in 1869 by the great missionary explorer, David Livingstone. The Upper Congo was explored by his successor, Henry M. Stanley, who organized there the International African Association, its promoter being King Leopold of Belgium. Stanley first told the world of the great material resources in ivory, rubber and other products of the Congo. The first exports from that section were confined to ivory and rubber, as the cost of transportation made it impracticable to bring any of the other products of that vast territory to the markets of the world. The shipments of rubber from the Congo began in 1887, when 33 tons were exported. The volume of exports increased rapidly, reaching 136 tons in 1890, over 600 tons in 1895, and reaching their



MAP SHOWING CONGO FREE STATE.

maximum, 6,614 tons, in 1901. This rubber was largely extracted from the *Landolphia* vine and secured in such a way that in most instances the vine was destroyed. THE INDIA RUBBER WORLD took early cognizance of the rubber possibilities of the Congo and in its December issue in 1892 it printed a two and a half page article descriptive of the development of that country and giving the first accurate map of the rubber section of the Congo that had appeared in this country.

The prospects for profitable operation were so great that many companies were formed to extract the Congo rubber and to develop the country in various ways. Among the pioneers in this work was an American, Warren C. Unckles, of New York, who arrived at Boma in July, 1892, and proceeding thence up the Congo river, established rubber camps along the tributaries of the Kassai, which flows into the Congo from the south.

The Conference of the Powers held at Berlin in 1885 constituted this territory into the Congo Free State, with Leopold II as sovereign, and from that time for the next 23

years Leopold had autocratic powers, the Congo being governed through three secretaries general, namely, of foreign affairs, finance and interior, all appointed by the King and responsible only to him. The various companies that received concessions in the Congo were as a rule compelled to give the government either one-half of their capital stock or, which amounted to the same thing, one-half of their profits. Some of these companies enjoyed large profits for many years. The Compagnie du Kassaï is said to have made a profit in the year 1905 of \$1,500,000, its dividends that year being three times the face value of its shares. One of the companies which received a very large concession amounting in two tracts to 2,471,000 acres—from Leopold was the American Congo Co., incorporated under the laws of the State of New York in October, 1906, but soon absorbed by the Intercontinental Rubber Co., a New Jersey corporation formed a few months later to take over these concessions.

It is safe to say that no other rubber producing country in the world has received the attention that has been directed to the Congo. For a number of years before Leopold gave up his control of the Congo Free State the whole Christian world was shocked from time to time by the stories that reached it of the atrocious treatment of the natives, who, it was stated, were compelled to gather rubber by the threat and infliction of various kinds of torture. Several books were written on this subject, pro and con, and it was made the theme of warm debates in the House of Commons. Finally the Belgian government appointed a committee to investigate, which, while denying actual atrocities, admitted that much pressure was brought upon the natives to compel them to do the desired amount of work.

In November, 1908, the Congo Free State passed from under Leopold's rule to the control of the Belgian parliament, and since that time nothing has been heard about cruelties on the Congo.

There are five large companies in Antwerp which, up to the closing of that port, were engaged in the importation of rubber, this number including Grisar & Co., Bunge & Co., Credit Colonial et Commercial—formerly L. & W. Van de Velde—and G. & C. Kreglinger.

Whether the outcome of the war will make any change in the ownership of the Congo country remains to be seen, but the future production of rubber from that section will not depend upon the flag that may fly on the banks of the Congo and the Kassaï, but upon the price of crude rubber in the markets of the world. Great efforts have been made during the last few years to keep the *Landolphia* vine from destruction, and since 1910 planting has been done on quite an extensive scale. The Belgian Government had planted up to 1912 three and a half million *Funtumia* trees, 250,000 *Hevea* and about 150,000 *Manihot* trees. Systematic tapping experiments have been carried on by both the government and private interests for the

last three years, and there is every reason to believe that the *Hevea* can be made to produce to advantage along the Congo; but if the eastern planters finally succeed in bringing their rubber to market at a shilling a pound, the planters along



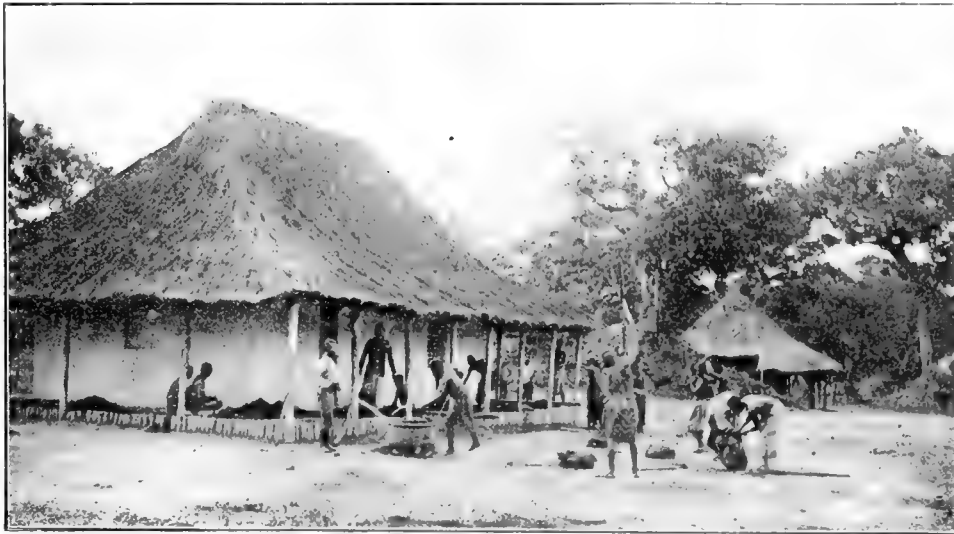
SHIPPING RUBBER ON THE CONGO.

the Congo will be confronted with a problem in competition that may be extremely difficult for them to solve.

BOOTH LINE SERVICE.

The steamship service between the United States and Northern Brazil and the Amazon has at no time since the beginning of European hostilities been seriously affected.

The usual sailings and the regular schedule have been maintained by the Booth Steamship Co., and every effort has been made to afford the usual facilities for the movement of rubber from the Amazon Valley. Imports of crude rubber have been received without interruption, and in some instances in quantities above normal. The difficulties of operating ocean going



CLEANING RUBBER IN THE CONGO COUNTRY.

steamships at the present time are many. For instance, the war risk, insurance on hulls and particularly the decline in exports from New York to Brazilian ports, make the shipping business between North and South America extremely uncertain, but the Booth line is determined to keep up efficient service in spite of the heavy additional costs and exceptional risks due to war.

WHAT IS "JALUBA" OR "JAPUDA" GUM?

An inquirer recently called up this office in search of information regarding "Jaluba" gum. A few days later a letter was received from another quarter with this question: "What is Japuda gum?" Unfortunately, this office was able to throw no light on either subject. Possibly Jaluba is another name for Japuda, or, conversely, Japuda but a synonym for Jaluba. Can anyone give any information concerning these two mysterious gums?

The Use of Rubber in the Armies of the World.

By Leon L. Watters, M. D., Hospital Supply Co., New York.

STRIPPED of its glamor, the practice of an army at war is to kill or maim as many of the enemy as possible by the employment of any of the many recognized "legitimate" means for dealing death and destruction. Thus land warfare exposes itself in all of its horror to the gaze of the lover of peace, as conforming exactly to General Sherman's classic designation of it.

This article does not aspire to deal at all with the ethics of war; it concerns itself solely with one economic phase of the practice of warfare, namely, the economic employment of rubber



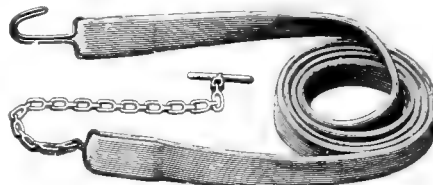
RUBBER BANDAGES

in its armamentarium. But the anomalies of strife with arms are immediately brought to the mind of the writer when he contrasts the elaborate methods which have been worked out by some of the brightest minds of nations with the one end in view of creating havoc, death and devastation, with the equally elaborate means that these same nations provide for alleviating the sufferings, injury and poverty which are the immediate results of war. While in times of peace the life and property of the individual are sacred and extreme precautions are taken to safeguard his well-being; while all the methods of science are exhausted to save the life of even the most humble citizen; while the skill of the most expert surgeon is brought to bear to repair the slightest injury to a helpless child or a decrepit octogenarian; yet, in time of war, every available means is employed to kill or maim the flower of a nation's manhood. The individual and the life or injury of the individual, as such, are lost sight of. Armies are simple masses with large numbers of units; they are employed as masses with a brutal disregard of the life and limb of the individual except as his death or injury, in large enough numbers, affects the fighting ability of the mass.

The armies of every civilized nation worthy of the name have special and well-organized branches of the service whose sole object is to care for the health and welfare of the soldier in times of peace and to minister to the injured and the sick in times of war. A story prevails among the correspondents who were on the scene to the effect that during the Balkan war, trainloads of injured soldiers were sent to the rear. The argument of the commanders was that it costs more to take care of a wounded soldier, whose usefulness has been impaired, than to bury a dead one. This story, whether true or not, is a strong argument for the use of rubber in the

army. Then commanders pay attention to the care of the wounded from two distinct motives; the first is the motive of humanity, which makes it incumbent on a nation at war to care for the injured of its own army and of its enemy; the second motive is an economic one, based upon the value of the individual soldier as a fighting unit. The soldier who is temporarily disabled and who can be nursed back to health and healed of his wound can again enter the ranks and become active as a useful member and thus help to effect the destruction of the opposing army.

To take care of the wounded in such manner that suffering is reduced to a minimum and the maximum number of lives saved, requires that the facilities of the hospital be duplicated to such an extent that at least temporary relief is as close as possible to the scene of hostilities. Thus the requirement of quick transportation is immediately presented, for means of relief must be such that it may be transported from place to place with practically the same speed as a moving



RUBBER TOURNIQUET

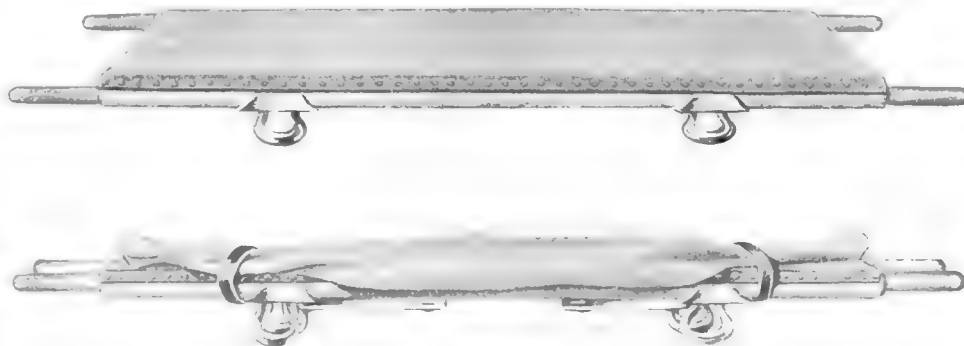
army, which means often over rough roads and under adverse conditions. Lightness becomes of prime importance as well as the property of being compressed into small bulk. Beyond this

is the requirement of impermeability to moisture. It is for these reasons that rubber becomes the ideal substance for employment in the manufacture of munitions for the Medical Supply Corps of armies in the field.

The uses of rubber for other than medical and surgical purposes in the army are well known. To enumerate only a few there might be mentioned the following: Waterproof coverings for wagons, guns and gun-carriages, army chests and the like, where there is employed either a rubber-covered

fabric similar to rubber sheeting or fabrics of cloth which are rendered waterproof by being impregnated with compounds of rubber. Rubber boots and shoes are part of the regular equipment of most armies, though they are made use of only under special conditions, on account of the more lasting qualities of leather.

Rubber sheets and blankets are in extensive use for protection from damp, and rubberized fabrics are even employed as tent coverings. Rubber-covered rain coats are in extensive use by the officers and chapeaus or mantles are employed by the privates as protection from rain. There is a growing tendency to employ rubber-coated fabrics wherever possible as coverings for medical pouches, first-aid kits, etc., and the

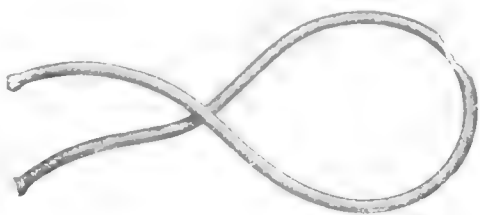


U. S. ARMY STRETCHER

rubber manufacturers will find the authorities of the Medical Supply Depots desirous of welcoming any suggestions for further applications of rubber to existing equipment.

Of decidedly varied employment, however, are articles of rubber for medical and surgical purposes. Experiment and experience have shown that articles of rubber fulfil the requirements both of lightness and of freedom from breakage. We enumerate a few of the more important items employed in the Field Medical Supply Department of our own army: Hot-water bottles; ice-caps; syringes, both of hard and soft rubber; atomizers; powder dusters; catheters; stomach, colon and rectal tubes; operating cushions or "Kelley pads"; air cushions and air beds; rubber gloves and finger cots; tubing; sheeting; tourniquets; aprons; funnels; bandages; crutch tips; medicine droppers; collapsible drinking cups; folding buckets and bath tubs; parts of inhalers; washers for hypodermic and other syringes.

Incidentally, the Medical Supply Division of the United States Army is said to be in a position to take care of the wants of an army far in excess of our present standing army, on forty-eight hours' notice.



UNITED STATES ARMY TOURNIQUET.

In addition to these, the governments use extensive quantities of hard rubber goods for general purposes. These embrace combs; tooth, hair and nail brushes; soap dishes, etc.

The Medical Supply Section of our own army is under the immediate jurisdiction of the surgeon-general, whose office is in Washington. Supplies for the army are purchased by the officers in charge of the various Medical Supply Depots, which carry stock in New York, St. Louis, San Francisco and some other cities. Supplies are generally purchased upon competitive bids. Specifications for annual stocks are issued once a year, but additional specifications are issued almost continually during the year. The Field Medical Supply Depot is a special branch of the service, with headquarters at Washington.

THE EMDEN'S END A RUBBER RELIEF.

It is stated that the "Emden," the German cruiser which sunk twenty-five or more merchantmen belonging to the Allies before it was brought to book by the Australian "Sydney," cost the rubber industry, or more accurately the rubber insurers, about a million dollars. Three of the merchantmen sunk by the "Emden's" guns had cargoes of rubber from the Far East, bound for London, amounting, all told, to about 3,000 tons.

A NEW LIFE-SAVING INVENTION.

A recent report of Consul General R. E. Mansfield, stationed at Vancouver, British Columbia, contains a description of a life-saving suit invented by Captain More, a shipmaster of Vancouver, and patented in Canada, Great Britain, France, the United States and Belgium. It is made of rubber and can be easily put on. It is entered from the top, is equipped with a hood which, when adjusted, leaves only the face exposed to the water. A belt, passing around the body just below the arms can be quickly inflated by blowing into a tube attached. The wearer floats in an upright position and watertight pockets on each side provide receptacles for food and liquids. Successful experiments have recently been conducted and demonstrations made in the use of this suit.

AMERICA AND THE EUROPEAN WAR.

By Ludwig W. Schmidt.

FROM general information received by the writer in private letters, it seems that the German rubber industry was fairly active during the first months of the war, and, considering the enormous demand for war materials and the influence rubber has on many industries connected with the production of such supplies, it appears that the demand for rubber manufactures will continue at least as long as Germany can keep the enemy outside her boundaries. The rubber industry in England is certainly as busy as it is in Germany, and its opportunities are greater. England can add to the demand from her own war office the considerable amount of private business done by Germany before the war, provided her industry is able to replace German goods in quality and price. Little definite information has been obtained regarding the French rubber industry, but it can be surmised that the works which are interested in the manufacture of war material will be kept busy.

Under these circumstances it is clear that the demand for raw rubber must be very large. Germany cannot get new supplies. It has, as far as can be ascertained, large quantities of raw rubber in stock, which, however, must some day be exhausted; and it is an interesting problem what Germany will then do. It is very likely that her reclaiming industry is already supplying that part of the demand which until now has been supplied by American reclaimers. It is impossible to say whether any amount of reclaimed rubber is still leaving this country for Germany. If so, the quantity must be small.

Everything, therefore, points to the conclusion that at the end of the war stocks in raw material as well as in reclaimed rubber will be small and that large replenishments will have to take place. It is impossible to say what the end of this conflict will be and what the economic situation in the warring countries will be at its conclusion. However, it seems practically certain that a new and strong demand for raw material and reclaimed rubber will arise as soon as normal conditions have been restored. This will materially affect the American reclaimer. The European field has been a very good one for him in the past and there is no reason why it should not again be as satisfactory. Of course it will take some time to resume old relations, and confidence will be shaken. Nevertheless, it would be bad policy to let the war interfere with development of business in Europe. The markets of England, France, Germany and some of the other countries are closed, but those of Spain and Italy remain open and it is to be hoped that these nations will be able to maintain their neutrality. Both these markets can be entered successfully by the American reclaimer, and it would be advisable to take steps at once to develop this export business, while Russia, one of the largest producers of reclaimed rubber, is greatly hampered in her movements and the Russian industry suffering in consequence. Having secured a foothold in these two markets, it will be much less difficult to resume business relations in the older markets when peace is restored than it would be if relations had been entirely cut off.

Incidentally it may be remarked that, as a result of the war, there will not only be a large demand for reclaimed rubber, but in addition to this there ought to be an increase in the supply of waste rubber. Whether this will be of the first class, of course, is doubtful. War waste as a rule is not of the highest grade, but the cessation of collection during the past few months will bring in its wake a larger volume of material, which ought to benefit the reclaimers in the United States. It seems probable, therefore, that the war, while at the moment stopping the business of the American reclaimer in Europe, will not injure it permanently. On the contrary, a large demand can be expected when normal market and manufacturing conditions are restored.

The Work of the Bureau of Standards on Rubber.

THE constitution of the United States gives to Congress the right to fix the standards of weights and measures.

Whether this provision of the constitution was necessary to justify the institution of the Bureau of Standards at Washington need not be discussed, but it may be cited as the authority for the action of Congress in providing for this bureau.

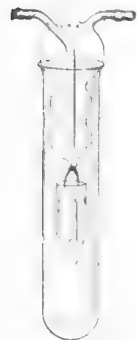


FIG. NO. 1.

There has been confided to it the charge of all the standard weights and measures in possession of the federal government, or at least such of them as are the standards from which our weights and measures are derived.

In connection with the standardization of weights, measures and apparatus of many kinds there is a large amount of work conducted along other scientific lines, including mechanical, chemical and electrical. Along what are known as more practical lines a great number of tests are made on a wide variety of materials, particularly those used in government supplies. Among the articles so used and tested are many kinds of rubber goods.

In many cases this bureau acts as the examining chemist for the departments which purchase the supplies. In doing this they have a broader idea than the ordinary chemist who is endeavoring to protect his client only, for the bureau tries to work with the manufacturer as well as with the purchasing agent so as to help the maker to produce the best goods as well as to provide those that are best suited for the government's use. The private consumer ordinarily wants to get the best goods and is not disturbed if others—particularly if they are competitors—get an inferior quality. Nor does the ordinary purchaser endeavor to help the manufacturer who furnished the goods. But this bureau believes it good policy to help the manufacturer, so as to secure desirable products for the government.

In pursuing this policy much work has been done on the preparation of suitable specifications which shall be at the same time just to both parties and allow the most economical article that is adapted to the purpose.

In the rubber line one notable instance of co-operation of this bureau with manufacturers and consumers is its work with the Joint Rubber Insulation Committee. Mr. J. B. Tuttle of the

Standards Vol. 8, No. 3 was published, entitled "The Determination of Total Sulphur in India Rubber." It was by C. A. Waters, associate chemist, and J. B. Tuttle, assistant chemist. A pamphlet entitled "The Sampling of Rubber Goods," was reprinted in the "Journal of Industrial and Engineering Chemistry," with the permission of the director of the bureau of Standards.

Circular No. 38 of the Bureau of Standards, published for distribution in 1912, is entitled "The Testing of Mechanical Rubber Goods," and the second edition was published in April, 1913. This contains notes on the sources of supply and collection of rubber, rubber substitutes and reclaimed rubber, as well as descriptions of the processes of manufacture, also physical testing of rubber, chemistry of rubber and regulations regarding tests. Most of the apparatus used by the bureau in the work is here illustrated, as well as the methods used in testing.



FIG. NO. 3. TESTING MACHINE OPERATED BY STEAM OR WATER.

In performing the chemical analysis there is no special apparatus used not found in most laboratories, but the extractors are always the most important feature of rubber analysis. Figure No. 1 shows the Wiley Soxhlet extractor as modified by Ford.

Figure No. 2 shows a hand testing apparatus for determining the bursting pressure of hose. Figure No. 3 illustrates a testing machine operated by a steam or water cylinder. Back of the machine is a press for cutting samples. Figure No. 4 shows a hand press and sample cutter with the cut sample beside it; while Figure 5 shows a set of rubber mills geared to, and operated by, a motor. The mills include a cracking mill, a mixing mill and a three-cylinder calender for making frictions, etc. The mixing mill and the calenders are arranged for steam and water circulation through the rolls. This apparatus has just been put in and it is expected that some very valuable experimental work will be accomplished with its aid. THE INDIA RUBBER WORLD has obtained from the bureau a description of their methods of chemical testing which follows in full.

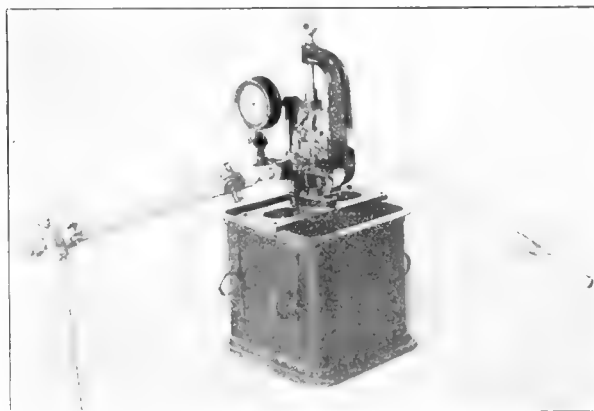


FIG. NO. 2. APPARATUS TO DETERMINE BURSTING PRESSURE.

bureau acted with the committee, and its proceedings were republished for general distribution with the approval of the bureau.

In 1912 Reprint No. 174 from the bulletin of the Bureau of

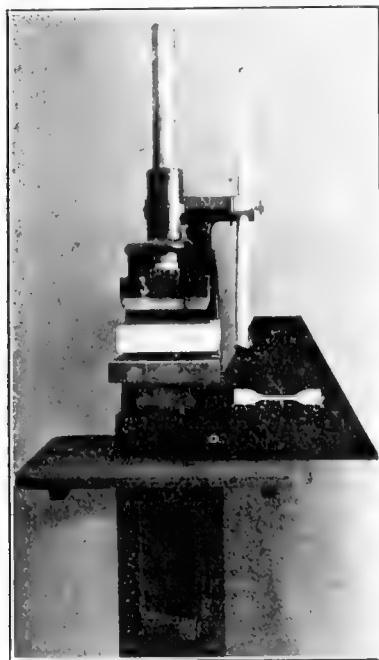


FIG. NO. 4. PRESS AND SAMPLE CUTTER.

THE BUREAU DESCRIBES ITS METHODS OF TESTING.

DEPARTMENT OF COMMERCE,
BUREAU OF STANDARDS,
WASHINGTON.

The methods given below are those now in use at the Bureau of Standards and are offered essentially as they appear in the sheets of instructions handed to all rubber analysts in the Bureau. They are not entirely original, but have been compiled from the various publications on rubber analysis and from the information gained through the routine testing of rubber goods for delivery on government contracts, and co-operative research with various scientific organizations. These methods are always subject to revision whenever the Bureau is convinced that changes would improve them.

PREPARATION OF SAMPLES.

1. **SOFT RUBBER**—Prepare a sample of not less than 25 grams, taking pieces from various parts of the original sample. With those having cover and tube, separate samples of each shall be made. From fire hose remove the backing before grinding.

2. **GRINDING**.—The sample shall be cut into small pieces and then run through grinder, taking for analysis only such material as will pass a 20-mesh sieve. Care must be taken to see that the grinder does not become appreciably warm during the grinding. If the nature of the material is such that it gums together so that it will not pass through the sieve (as would be the case with undervulcanized samples), it will be sufficient to pass the material through the grinder twice and accept all the material for the final sample. Crude rubber shall be cut with scissors.

3. **HARD RUBBER**.—Samples of this material shall be prepared for analysis by rasping.

REAGENTS.

4. Acetone shall be freshly distilled over anhydrous potassium carbonate, using the fraction obtained at 56 to 57° C.

5. Alcoholic potash shall be of normal strength, made by dissolving the required amount of potassium hydroxide in absolute alcohol, and allowing it to settle. Only the clear solution shall be used.

6. The nitric acid-bromine reagent shall be prepared by adding a considerable excess of bromine to concentrated nitric acid, shaking thoroughly, and allowing it to stand for some hours before using.

7. The fusion mixture for sulphur determinations shall be made by mixing equal quantities of sodium carbonate and powdered potassium nitrate.

8. All reagents shall be of C. P. quality.

9. Barium chloride solution shall be made by dissolving 100 grams of barium chloride in one liter of distilled water, and adding two or three drops of conc. hydrochloric acid. If there is any insoluble matter or cloudiness, the solution shall be heated on the steam bath overnight, and filtered through 589 blue-ribbon filter paper.

ANALYSIS.

I—MECHANICAL GOODS.

10. **ACETONE EXTRACT**.—Place a 2-gram sample in an acetone extracted S. & S. paper thimble, and extract continuously with acetone for eight hours, unless the solution in the thimble is still colored at the end of that time, when the extraction shall proceed the next day for a further period of four hours. Transfer the extract to a tared 100 or 150-cc. Erlenmeyer flask, using chloroform or benzene for dissolving any material which may have separated from the solvent during the course of the extraction. Drive off the solvents at as low a temperature as possible, using a gentle current of air. Dry the flask and contents in an air bath, at 90 to 95° C.; cool and weigh. Call the residue "acetone extract, uncorrected." Calculate the results to percentage.

11. **FREE SULPHUR**.—Add to the flask from par. 10, containing the acetone extract, uncorrected, 50 to 60 cc. of distilled water, and 2 or 3 cc. of bromine. (If the acetone extract indicated a large amount of free sulphur, the amount of bromine used may be increased). Heat gently on the steam bath until the solution is practically colorless, filter into a 250-cc. beaker. Cover the beaker with a watch glass, heat to boiling on the steam bath, add 10 cc. of 10 per cent. barium chloride solution, and allow the precipitate to stand overnight. The next day filter the precipitate through an 11-cm. 590 S. & S. filter paper. Ignite in a small porcelain crucible, using a small Bunsen flame, and not allowing the paper to inflame; cool and weigh. Calculate the barium sulphate to sulphur by means of the factor 0.1372, and calculate the percentage of free sulphur.

12. **ASH**.—Wrap a 1-gram sample in an 11-cm. 590 S. & S. filter paper, and after extracting with acetone for four hours, transfer to a medium sized porcelain crucible and ignite at the lowest possible temperature; cool and weigh.

13. **SULPHUR IN ASH**.—Add a few drops of conc. nitric acid to the ash from par 12, stir with a small glass rod, and evaporate off the excess acid on the steam bath. Add 5 grams of fusion mixture (par. 7), and heat until fused. When cool, place the crucible in a 400-cc. beaker, cover with water, and heat on the steam bath for two or three hours. Filter into a 600-cc. beaker (reserve the insoluble residue for testing according to par. 14), add 7 to 8 cc. conc. hydrochloric acid to the filtrate, cover, and heat to boiling on steam bath. Add 10 cc. of 10 per cent. barium chloride solution, and allow to stand overnight. Treat the barium sulphate precipitate as under par. 11. Calculate to sulphur by the factor 0.1372.

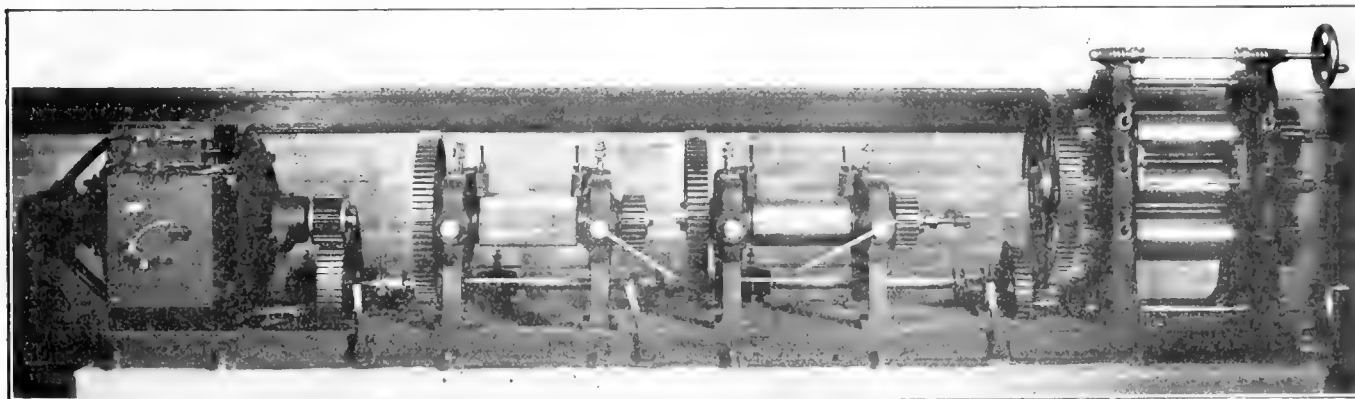


FIG. NO. 5. SET OF RUBBER MILLS GEARED TO, AND OPERATED BY, A MOTOR

14. **BARYTES.**—In the event that the total sulphur is limited by specification, and barytes is permitted as a filler, the latter must be determined, since the sulphur present in this mineral must be deducted from the total sulphur. The barytes is calculated from the barium in the ash determined as follows: Filter off the insoluble matter after the fusion and extraction in par. 13, wash back into the original beaker with hot water, add 5 cc. of 10 per cent. hydrochloric acid, and heat the solution on the steam bath until as much as possible is dissolved. Filter through the same filter as before, washing thoroughly with hot water. Nearly neutralize the solution with sodium carbonate, leaving it slightly acid. Saturate the solution with hydrogen sulphide, and when the lead sulphide has settled filter into a 400-cc. beaker, and wash thoroughly. The total volume should not be over 200 cc. Cover the beaker containing the filtrate, heat to boiling, and add 10 cc. of 10 per cent. sulphuric acid. Allow the precipitate to stand overnight. Filter off the barium sulphate as directed in par. 11. Calculate the percentage of barytes. Then calculate the percentage of sulphur in the barytes by the factor 0.1372.

15. **TOTAL SULPHUR.**—Place 0.5 gram of rubber in a porcelain crucible of about 100 cc. capacity. Add 20 cc. of the nitric acid-bromine mixture (par. 6.), and cover the crucible with a watch glass. Heat very carefully for half an hour to an hour, remove the cover, rinsing it with a little distilled water, and evaporate to dryness. Add 5 grams of fusion mixture (par. 7) and 3 to 4 cc. of distilled water. Digest for a few minutes, and then spread the mixture halfway up the side of the crucible to facilitate drying. Dry on a steam bath or hot plate. Fuse the mixture, using a sulphur-free flame, until all the organic matter has been destroyed and the melt is quite soft. Allow to cool, place the crucible in a 600-cc. beaker, and cover with distilled water. Digest 3 or 4 hours on the steam bath. Filter into an 800-cc. beaker, washing thoroughly with hot water. The total volume should be about 500 cc. Add 7 to 8 cc. conc. hydrochloric acid to the filtrate, and heat on the steam bath. Test the solution for acidity with congo paper, add 10 cc. 10 per cent. barium chloride solution, and allow to stand overnight. Filter off the barium sulphate as before. Calculate to percentage of sulphur present.

16. CALCULATIONS.—

- Subtract the "free sulphur" from the "acetone extract, uncorrected," and report the difference as "acetone extract corrected."
- Subtract the sulphur in the ash from the ash as determined in par. 12, and report "ash, sulphur-free."
- Subtract from the total sulphur determined according to par. 15, the percentage of sulphur present as barytes, if the latter determination has been made (see par. 14), and report the difference as "total sulphur, corrected." Then add the sulphur so deducted to the ash, in this case reporting the latter simply as "ash, corrected." In other words, only the sulphur other than that in barytes will be deducted from the ash when the total sulphur is corrected for barytes.
- Subtract from 100 per cent. the sum of the acetone extract, corrected, total sulphur (corrected or not as the case may be), and ash (sulphur-free, or corrected for sulphur other than barytes) and call the remainder "rubber by difference."
- Divide the acetone extract, corrected, by the sum of the acetone extract, corrected, and the rubber by difference, and call the result, "ratio, acetone-extract rubber." It will be simpler to express the results in percentages. When new rubber only is used this will give the percentage of acetone-soluble matter in the rubber.

17. **SPECIFIC GRAVITY.**—Make this determination in a pycnometer, using about 5 grams of rubber cut into small strips, taking care to avoid having air bubbles adhering to the rubber. Do not use a ground sample for this determination, since it is intended to determine the specific gravity of the compound as a whole. Aside from the difficulty of completely removing air bubbles, the specific gravity of a sample which is at all porous will be, after grinding, higher than when this is determined on strips. Calculate the specific gravity on the basis of water at 15° C. as 1.00.

18. **ALCOHOLIC POTASH.**—Fire hose, tested according to the National Board of Fire Underwriters' specifications, calls for an alcoholic-potash extraction. It is performed on the dried

rubber remaining after the acetone extraction. The complete method will be given under par. 28.

II INSULATION, 30 PER CENT. PARA.

19. **GENERAL.**—The tests to be made on high-grade insulation compounds are: Acetone extract, unsaponifiable matter, waxy hydrocarbons, free sulphur, ash, and total sulphur, and sometimes alcoholic potash and chloroform extracts.

20. **ACETONE EXTRACT.**—Determine as under par. 10.

21. **UNSAAPONIFIABLE MATTER.**—Add to the acetone extract from par. 20, 50 cc. normal-alcoholic potash (par. 5), heat on steam bath under reflux condenser for two hours; remove condenser and evaporate to dryness. Transfer to separatory funnel, using about 100 cc. water; add 25 cc. ether, and shake. Allow the two layers to separate thoroughly, then draw off the water layer. Continue the extraction of the water layer with fresh portions of ether until the ether will no longer remove any unsaponifiable matter; unite the ethereal layers, and wash with distilled water, adding the first wash water to the extracted aqueous layer. This aqueous solution is reserved for the free-sulphur determination (par. 23). Transfer the ether to a tared Erlenmeyer flask, distill off the ether, dry at 90 to 95°C.; cool and weigh.

22. **WAXY HYDROCARBONS.**—To the unsaponifiable matter from par. 21, add 50 cc. absolute alcohol, and heat on the steam bath for one-half hour. Place the flask in a mixture of ice and salt, and let stand for one hour. Filter off the separated waxy hydrocarbons, using S. & S. 589 blue-ribbon filter paper, and applying a gentle suction. Wash with alcohol which has been cooled in an ice-salt mixture. The funnel should be surrounded by a freezing mixture, in order that the temperature may not rise during filtration. Dissolve the precipitate from the filter paper with hot chloroform, catching the solution in a weighed 100 to 150 cc. beaker. Wash the flask with hot chloroform and add to the same beaker, in order to include any insoluble matter adhering to the walls of the flask. Evaporate off the solvent, dry the residue at 90 to 95°C., cool and weigh.

23. **FREE SULPHUR.**—Transfer the water layer from par. 21 to a 250-cc. beaker, and heat on the steam bath until the ether has been removed. Add 25 cc. bromine water, heat one hour, add 5 cc. conc. hydrochloric acid, and heat until the excess of bromine has been driven off. (Test for acidity with congo paper; the amount of acid specified is sufficient if instructions are followed exactly, and a large excess of acid is to be avoided.) Filter into a 250-cc. beaker, add 10 cc. 10 per cent. barium chloride solution, and finish the determination as under par. 11.

24. **ASH.**—Proceed as under pars. 12 and 13.

25. **TOTAL SULPHUR.**—Proceed as under par. 15. There will be no correction for barytes.

26. CALCULATIONS.—

- Subtract the sum of the free sulphur and waxy hydrocarbons from the acetone extract, uncorrected, and report the difference as "acetone extract, corrected."
- Subtract from 100 per cent. the sum of the acetone extract, corrected, waxy hydrocarbons, ash sulphur free, and total sulphur, and report the result as "rubber by difference."
- Divide the acetone extract, corrected, by the sum of the acetone extract, corrected, and the rubber by difference, and report the result under "ratio, acetone extract rubber," as under par. 16e.

27. **CHLOROFORM EXTRACT.**—Without removing the acetone from the rubber from par. 20, extract with chloroform for four hours. Evaporate off the solvent in a weighed flask or beaker, dry at 90 to 95°C., cool and weigh. Reserve the rubber for the alcoholic potash determination.

28. **ALCOHOLIC POTASH EXTRACT.**—Dry the rubber at about 50 to 60°C., transfer to a 200-cc. Erlenmeyer flask, add 50 cc. alcoholic potash solution, and heat under a reflux condenser for four hours. Filter through a folded filter into a 250-cc. beaker, washing with 50 cc. of 95 per cent. alcohol, and then 50 cc. of boiling water. Evaporate the filtrate to dryness. Transfer the residue to a separatory funnel, using about 75 cc. of distilled water. Add a few drops of methyl orange, and acidify the solution with 10 per cent. hydrochloric acid. Extract with four portions of ether, 25 cc. each, unless the fourth portion should be colored, when the extraction should be continued until no further quantity can be extracted. Unite the ether fractions, wash thoroughly with distilled water, and evaporate the ether in a weighed beaker. Dry at 90 to 95°C.; cool and weigh.

What the Rubber Chemists Are Doing.

THE PRODUCTION OF ISOPRENE FROM COMMERCIAL TURPENTINE.

THE practical basis for all synthetic rubber is the production of isoprene, and if this can be accomplished in any practical and cheap way the production of a synthetic rubber on a competitive basis with the plantation varieties would be not only possible but probable.

Therefore any method of making isoprene from cheap raw materials will always be of importance to the rubber industry.

The United States is the world's greatest producer of turpentine, and this oil has been used before to some extent as a raw material for the production of isoprene, but the results have not been in all cases satisfactory.

Some experimental work on turpentine and other pine oils has been done at the University of North Carolina by Chas. H. Herty and J. O. Graham, which has recently appeared in print in the "Journal of Industrial and Engineering Chemistry," from which we quote an abstract: "In connection with studies of rubber made by polymerization of isoprene Harries and Gottlob (Ann. vol. 383, p. 228) described a method for the preparation of isoprene from spirits of turpentine by means of the 'isoprene lamp.' In this method the spirits of turpentine is boiled in a flask just below the neck of which is suspended an electrically heated platinum wire coiled somewhat like the filament of a tantalum electric light."

The vapors are partly decomposed as they pass upward across the heated wire. The flask is attached to an upright condenser maintained at a temperature of 50 deg. C. for condensing the unchanged (and polymerized) vapors of the turpentine. Beyond this is an inclined condenser kept cool and a receiver surrounded by a freezing mixture. Redistillation of the crude product from the receiver gives the isoprene distilling between 35 and 37 deg. C.

Harries and Gottlob obtained only a yield of 1 per cent. from commercial pinene or American turpentine as compared with 30 to 50 per cent. from commercial limonene. They therefore concluded that the production of isoprene from turpentine was due solely to the presence of small quantities of limonene.

Professors Herty and Graham, in view of the interest in their section of the country in the use of turpentine, have experimented not only on the production of isoprene from the commercial turpentine of that section, but also have experimented with the volatile oil of *Pinus Serotina*, or pond pine, and also with refined spruce turpentine.

Using the Gottlob and Harries apparatus, and heating the flask in a bath of cottonseed oil, a current of 2.25 amps. maintained a red glow on the wires which were wound around a pipe-stem triangular prism.

The isoprene produced was redistilled through a Hempel column, and the pure product, distilling between 36 and 37 deg. C., was taken as isoprene. Here is the result of two of their experiments:

First Experiment—200 c. c. of turpentine was boiled in the isoprene lamp until no more volatile bodies came over; and on purifying the distillate it was found that there was a yield of 18.5 per cent. of crude oil and 5.50 per cent. isoprene. The residue in the flask was 103 c. c. Thus 48 per cent. distilled over producing 18.5 per cent. distillate, showing 61.5 per cent. of distillate decomposed into incondensable gases, producing 38.5 per cent. light oil, and leaving a final residue of 52 per cent. more or less of polymerized oil. At present market prices this would make the material cost of isoprene \$1.13, allowing nothing for by-products or cost of making.

Even with a theoretical yield of rubber of first quality this

would not be a practical process, but it is much more practical than many others which have been exploited, and it points the way for improvements which may give a yield that will bring it within commercial possibilities.

Second Experiment—Commercial turpentine was fractionally distilled, and the first portion was taken off between 155 and 156 deg. C., which would contain most of the pinene. This gave a yield of 8 per cent. isoprene. This gives a material cost of 78.5 cents per pound, which is approaching commercial limits. The higher boiling-point residues from this distilled turpentine gave practically no isoprene, so it is concluded that the isoprene comes from the pinene in the turpentine.

With the oil from pond pine, which is rich in limonene, a yield of 12 per cent. isoprene was obtained.

It appears that the oil of pond pine is an oleo resin, and that it was distilled in a vacuum to produce that portion which contained the most limonene. Owing to the expense of such an operation it would make the cost greater if isoprene were produced from this substance than if produced from the distilled turpentine of the second experiment. This third experiment is, therefore, of scientific and theoretical value only.

Pine oil was also experimented on in a fourth experiment. This produced 4 per cent. of isoprene.

Pine oil is produced by the distillation of stumps or light wood from the yellow pine tree of the south, and this industry has assumed some importance of late years so that this pine oil appears on the market as a regular article of commerce. It is an oil with a specific gravity of .9403, and has a higher boiling point than turpentine, and is sold at a lower price. There is not usually enough difference in price, however, to balance the disadvantages of the smaller yield as compared with turpentine. In producing this 4 per cent. only 37.5 per cent. of the oil was distilled over, the balance remaining as a residue in the still.

The last experiment was made on spruce pine turpentine, which was produced as a distillate from the wood in a digester used for making soda pulp. This yielded practically no isoprene. The oil boiled between 171 and 174 deg. C.

From the above work it would seem that it is only necessary to get better conditions under which a greater yield of isoprene can be obtained from distilled turpentine than were gotten in these experiments to produce isoprene, and in turn synthetic rubber on a competitive basis with the natural product.

We note the specification of British patent No. 13,825, granted to C. K. F. L. Gross, of Bevön, Soon, Norway, for the manufacture of isoprene by treating the vapors of turpentine oil with one or more metallic oxides at temperatures below 700, copper oxide being instanced as suitable. The same inventor proposes to manufacture synthetic caoutchouc, according to British patent No. 13,826, by heating isoprene trioxymethylene as a polymerizing agent.

ANOTHER ACCELERATOR.

Another accelerator has been put on the British market similar to those described in the September issue of this journal in the article entitled "The Influence of Nitrogen Compounds on the Vulcanization of Rubber." This accelerator, which is called "Accelerene," is said to be an invention of an English chemist to whom protection has been granted. It is in the form of a green powder which is added to the mixing in the proportion of about one-half per cent., and which thereby reduces the time of vulcanization to about one-third that required in the ordinary way. Larger quantities reduce the time still further. It is claimed that the use of "accelerene" makes the product superior

in strength to that vulcanized in the ordinary way, and it is assumed that the shorter heating diminishes the amount of depolymerization, while effecting a more complete combination between the rubber and the sulphur. It is claimed that 100 parts of Pará and 10 parts of sulphur may be fully vulcanized by heating for 25 minutes at 40 pounds in the presence of one-half per cent. of "accelerene," while with 40 parts of sulphur a hard vulcanite is obtained by curing for two hours at 45 pounds. Its use is said also to prevent "blooming" or "sulphuring."

Attention has recently been called in these pages to the use of vanadium oxide and tungstic acid as accelerators.

A POSSIBLE NEW RUBBER CEMENT.

VULCANIZATION OF RUBBER SOLUTIONS BY THE ULTRA-VIOLET RAYS.

M. HEILBRONNER read a paper before the International Rubber Conference entitled: "The Study of Rubber Solutions Vulcanized by the Ultra-Violet Rays." This is probably a continuation of the works of Heilbronner and Bernstein, published in the *Compt. Rend.* May 11, Volume 138, 1914, page 1343, and abstracted in the *Chem. Zentr.*, Volume 5, 18, 1914, No. 4, page 326, and *Koll. Zeit.*, Volume 12, 1913, page 4, where they had shown that rubber combines with sulphur in a solution under the influence of ultra-violet rays presenting a remarkably staple gel. By evaporating the solvent a pellicle of vulcanized rubber was produced which was insoluble in solvents from which it had been evaporated. They also there stated that the ultra-microscopic method shows great quantities of small particles, but there must be many more such particles which are invisible. Dr. Heilbronner in his address said that Victor Henri in 1909-1910 was the first to expose rubber to the ultra-violet rays, carrying out vulcanization with films of solutions of rubber. Attention might be called to French patent No. 460,780, issued July 26, 1913, but which under the international conventions has the date of July 26, 1912, in which the vulcanization of rubber solutions by ultra-violet rays is claimed, and it is stated that 3 per cent. plantation rubber and sulphur in benzene exposed in thin layers vulcanize rapidly, sulphur to the extent of from $1\frac{1}{2}$ to $2\frac{1}{2}$ per cent. combining with the rubber.

Elaborate diagrams were presented by M. Heilbronner regarding the results obtained by various experiments. It appears that it is not desirable to use either flowers of sulphur or stick sulphur, both being to a great extent insoluble, but crystals of sulphur should be used. The most interesting thing is the suggestion that these solutions of rubber so vulcanized may have industrial application. They are said to be suitable for all kinds of cementing or rubberizing operations, and are capable of resisting all mechanical strains, as well as the action of heat. They can be used particularly for joining and rubberizing leather, and consequently will be valuable in the shoe industry.

Lastly, the repairs of all rubber goods, tires, inner tubes, etc., can be readily carried out by means of vulcanized solutions.

While a few years ago it would have been considered fantastic to suggest the practical use of rubber vulcanized by ultra-violet rays, recent progress has been such that by the use of a Peter Cooper Hewitt mercury light produced in a quartz tube, the ultra-violet rays pass through with such ease that they have been suggested for many purposes, such as sterilization of water, and it is possible that these solutions of vulcanized rubber may become of considerable technical importance.

By using vulcanized solutions of an altogether different concentration, 1 to 1 per cent. a positive absorption of the solution is obtained and the two pieces are no longer separated by a layer of rubber; they are in immediate contact and penetrate one into the other. By using these vulcanized solutions one obtains not an ordinary joint, but a true autogenous rubber welding.

Dr. M. G. Bernstein also read a paper entitled "The Vulcanization of Rubber by Ultra-Violet Rays." He found that a rubber solution mixed with sulphur and exposed to the action of the ultra-violet rays thickens considerably, and is transformed into a gelatinous mass; furthermore, vulcanization takes place and sulphur enters into the combination.

British Patent No. 17,195 of 1914 has been issued to G. Bernstein, and is for a process of vulcanizing a rubber solution containing 6 per cent of rubber, with 10 per cent of the rubber weight of sulphur dissolved in benzene by spreading, for example, on a moving belt a layer of about $\frac{1}{2}$ mm. thickness, and exposing it to the ultra-violet rays from a quartz tube for 45 seconds.

This would appear to be rather a difficult thing to do, for under the heat of the rays the solvent would evaporate from this thin film. It appears that if this solution of rubber, vulcanized in this way, is once dried that it cannot be brought into solution again, and accordingly cannot be used as a cement.

RECENT CHEMICAL PATENTS.

Patent for process for treating rubber, issued to Staunton Gray, Muskegon, Mich. U. S. Patent No. 1,115,031. This seems to be a process for producing rubber sponge or foam. The compound is mixed with a light hydrocarbon solvent and brought to a stiff solution. Then it is submitted to a vacuum to make it spongy, when the vulcanizing agent is admitted. (Evidently cold vulcanization is intended.) The vulcanizing agent is then neutralized. The essential idea is to produce a sponge by the vaporizing of the solvent under the vacuum, then to vulcanize cold in this state. It does not appear how the vulcanizing agent is to saturate the compound without destroying the vacuum, in which case the solvent would condense and destroy the sponge effect before the vulcanizing liquid reached it.

U. S. Patent No. 1,112,853 is for producing zinc oxide, assigned to the New Jersey Zinc Co.

THE CREOSOTE CURE FOR LATEX.

British Patent No. 13,438, of 1913, has been issued to Cleland Davidson, for a process of coagulating latex. In this patent phenol, cresylic acid or the higher tar acids are neutralized with caustic soda, and to this aqueous solution is added liver of sulphur or any other polysulphide or sulphide of potash, or soda and formaldehyde solution may then be added. A small proportion of this solution is added to the latex. The essential thing is the creosote and alkali. The other materials may be omitted. After this alkali treatment an acid is used for coagulation. The object of the treatment seems to be to cause the caoutchouc in the course of the coagulation to become homogeneously and intimately impregnated by, or incorporated with, a preservative substance. Perhaps this creosote treatment might have the same influence, to some extent, as the creosoting accomplished in smoking Pará by the Brazilian methods.

U. S. patent No. 1,098,858, granted June 2, 1914, to Franz Webel, who assigns to the Badische Co., claims the production of chlorine derivatives by reacting with chlorine on trimethyl ethylene in a vacuum. This is part of the operation of producing rubber from petroleum oils, which method has the great advantage of having a plentiful and cheap supply of raw materials.

EXPERIMENTS IN RUBBER DYEING.

Dr. Rudolph Ditmar, in "Gummi Zeitung," October 23, 1914, p. 85, has a very elaborated article describing a large number of dyes suitable for rubber dyeing and giving the results of many experiments in their use. Attention was called in the November issue of THE INDIA RUBBER WORLD to the United States patents Nos. 1,113,614 and 1,113,759, on this system of dyeing, with comments on each.

Rubber Solvents.

WHILE the larger quantity of rubber is made into manufactured products without having been brought into solution, yet there are so many uses for rubber in solution that the matter of solvents becomes of great importance. Rubber being a hydrocarbon is soluble in the usual hydrocarbon solvents. These are usually those not soluble in water and of an oily nature. A number of the more usual solvents will be described in the following paragraphs, beginning with those derived from petroleum.

SOLVENTS FROM PETROLEUM.

The petroleum oils are by far the cheapest oils in commerce, and they are solvents of rubber and are the most extensively used of any class for that purpose. In defining petroleum oils it is hard to make definite distinctions, for every oil is a mixture of many separate chemical substances, and the names used to designate them in the trade and the tests used are indefinite and the products of no two manufacturers agree in name or test.

Petroleum oils consist in the main of hydrocarbons of several series, and a large number of each series is found in each kind as it is taken from the ground.

The first oils obtained from Pennsylvania and West Virginia consisted of oils of the paraffine series exclusively having the general formula, C_nH_{2n+2} . This series begins with marsh gas with one carbon atom and goes up to the paraffine waxes with many carbon atoms in each molecule, but each compound has the same ratio of carbon and hydrogen as pointed out above.

When this oil is distilled there first passes off a little marsh gas which is dissolved in the oil, and following this is a series of products up to pentane, which boils at 36 degs. C., which are mostly lost, though products are sometimes made which will only remain liquid under pressure and will rapidly evaporate in the air. For example, there is a product known as cymogene which boils at the temperature of melting ice and has a specific gravity of 110 Be., and the next higher product is known as rhigidene, which boils at about 65 degs. F., or ordinary temperature, and has a specific gravity of 100 Be. Sometimes a product known as petroleum ether, boiling between these points, say about 50 degs. C. is made.

The next product obtained by distillation of Pennsylvania oil is petroleum ether of 85 degs. Be., or gas machine gasoline, which is very scarce now. It begins to boil at about 50 degs. C. and contains some that boils at 120 degs. C. This is sometimes called benzine but must not be confused with the coal tar benzol.

Then there is a series of gasolines of different gravities and boiling points. It was customary to use gasoline of 76 degs. Be., but this product is now almost unobtainable, and that of 66 Be., with a boiling point ranging up to 140 degs. C., is largely used. After these products come the kerosenes, or burning oils, which are not volatile enough to be used for solvents which have to be later evaporated.

The petroleum trade has clung to the use of the Baume hydrometer as a standard for grading oils, and usually no other characteristic of the oil than its Be. gravity is used in the trade. While all the oil used was of the paraffine series, the Be. gravity was an indication of its relative volatility. This is now of no value when other hydrocarbons are present.

When the oil of Pennsylvania became exhausted the oils of Ohio assumed great importance, and these were found to differ in many respects. While the oil of Pennsylvania was of a dark greenish-red of from 49 to 34 Be., it was quite mobile and rather transparent, and had no impurities, such as sulphur or other objectionable matter. The Ohio oils were found to contain large quantities of sulphur and required special treatment, and there were in them other hydrocarbons than the paraffines. Now these other hydrocarbons which correspond in boiling point with the

paraffines have different specific gravities and are usually heavier, so that a gasoline or naphtha from them of a heavier gravity, say 70 Be., might have as low an average boiling point as one from Pennsylvania oil of 76 Be. As the products of the fields of Illinois, Texas, California, Wyoming and Oklahoma came into the market in turn, it was found that these oils consisted largely of other series of hydrocarbons and that in many cases they contained an asphalt base instead of a paraffine base. Many also contained much sulphur and some contained little or no gasoline or naphtha.

These oils from the western part of the United States contain large amounts of oils of the olefine series and some of the acetylene or aromatic series. The latter, while having a different gravity from the paraffine series when of the same boiling point, are as good for rubber solvents as the paraffine hydrocarbons, and indeed often better.

In purchasing petroleum naphthas, therefore, at the present time it is not sufficient to ask for a naphtha of a certain gravity, but it must be examined and tested as to its boiling point. If the oil begins to distil too low it is rather dangerous, as it will be more inflammable; that is, the vapors given off at ordinary temperatures will ignite easily and will carry a long way from their source and will explode if they come into contact with a light or flame. If there is much of a residue which distils only at a high temperature, the solvent will be too slow in drying and the rubber dissolved in it may remain tacky. The naphthas should also be tested for their dissolving power, as it may vary widely according to the hydrocarbon series present.

Rubber manufacturers have been confronted for a number of years with constantly rising prices for naphthas, and a constantly poorer grade has been received. This situation had no connection with conditions in the rubber trade, but was due to the enormous increase in demand for gasolines for motor vehicles.

The demand created the supply, for it stimulated chemical experiment, and methods have been invented whereby the heavy oils can be "cracked" by distillation under pressure to produce light oils or gasoline, and this process is used on a very large scale. Another influence that has lowered the price of gasoline has been the discovery of oil in the "Cushing Pool" in Oklahoma, where a well was drilled a short time ago that flowed 5,000 barrels daily, which was allowed to go to waste for over a week. This and other previous like samples of criminal negligence in wasting nature's lavish resources have compelled the State of Oklahoma to make an attempt to regulate the flow and waste of oil. Gasolines have recently dropped from about 18 cents to 13 cents and even as low as 10 cents per gallon, and disturbed European conditions will lower them still further, and consumers should now insist on being furnished a suitable naphtha.

CARBON BISULPHIDE.

This excellent rubber solvent is a chemical prepared by the direct combination of carbon and sulphur under the influence of high heat, and in America almost the entire amount is made by heating by electrical means. Its solvent powers for rubber are great, and its great volatility makes it a most rapid dryer, but it also makes it a most explosive compound. When mixed with air and heated to 150 degs. C. it will explode, and cases are known where it exploded by the friction of pouring it out of a narrow glass tube. It must, therefore, be handled with great care to prevent explosions. Its boiling point is 46 degs. C. and its gravity is 1.29. It therefore weighs 10¾ pounds per gallon.

TURPENTINE AND PINE OIL.

Turpentine is not much used as a solvent because of late years it has been high-priced. But still more recently very low prices have been seen in this trade, and the outlook is for low prices

for a long time. It is, therefore, worth while considering these as solvents—particularly what are known as "Wood Turpentine" made from the dead wood. These usually have a very disagreeable odor, and this is fatal to their use when they appear in the finished goods like paints and varnishes, but where they are removed their odor can be tolerated in the workrooms with proper mechanical ventilation. Pine oil is also made from wood at the same time as turpentine, and is a less volatile compound. Both of these oils will dissolve rubber better than petroleum naphthas and as well as coal tar products, and the volatility of turpentine is just right for many purposes.

ETHER.

This is an excellent solvent, but nearly as volatile and dangerous as carbon bi-sulphide. It has only a faint, pleasant odor. It is rather expensive, selling at 18 cents per pound, but as it is made from denatured alcohol, its price may be reduced in the future.

THE NON-INFLAMMABLE SOLVENTS.

There is a large number of non-inflammable rubber solvents which are in nearly all cases compounds of chlorine with the hydrocarbons. Among them may be mentioned: Carbon tetrachloride, chloroform, di-chlor-methane, tri-chlor ethane and tetra-chlor-ethane. The chlor-ethylenes have also come on the market. These are as follows: Di-chlorethylene, boiling point 55 C.; tri-chlorethylene, boiling point 88 C., or 190 F.; tetra-chlorethylene, boiling point, 121 C., or 249 F., and specific gravity of 1.60. All the above are made in Europe and were until recently sold at about 7 cents per pound. The last one mentioned is, however, made as a by-product in the United States when making carbon tetra-chloride.

CARBON TETRA-CHLORIDE.

This is the most available non-inflammable solvent, the price recently having been 6.5 cents per pound. It is now much higher, but as it is made in this country, it will probably soon be again available. This solvent is used as a fire extinguisher, and with 60 per cent. tetra-chloride and 40 per cent. naphtha the mixed solvent will not explode or burn.

Other unflammable solvents which may soon come into use are "Dutch liquid," or ethyl chloride, C_2H_5Cl , with a specific gravity of 1.25 and boiling point of 84 degs C., and propylene chloride, C_3H_5Cl , the specific gravity of which is 1.165 and the boiling point of which is 97 degs. C. Their manufacture has been begun in this country.

Were it not for the price at which the chlorinated compounds are held, these would be universally used on account of the lessened risk in using them, compared with the hydrocarbons themselves, but they will never, perhaps, be brought down to a comparative price. When, however, the solvents can be in large part recovered, as is sometimes possible, then the additional price for the nonflammable solvents will not prohibit their use, particularly in those places where, as in a large city or in a large factory, any fire would endanger a very large amount of property.

OTHER SOLVENTS.

There are other solvents of rubber among the essential oils and balsams and oleo resins. On account of the price, however, these are seldom used, though some were formerly used in rubber mixings to make them adhesive; for example, Canada Balsam and Oregon Balsam of fir and Venice turpentine. These are all exudations of trees of the pine family.

Of the basic chemical bodies which are oils nitro-benzol may be mentioned. It has been used as a solvent for vulcanized rubber in analysis, though C. O. Weber preferred the nitro-toluol. Pyridine is also a basic body which will dissolve rubber, but Kenneth MacKenzie pointed out (Journal of Industrial and Engineering Chemistry, 1909, p. 361) that pyridine is liable to be contaminated by the hydrate which boils at 94.5 degrees C. which

does not dissolve rubber, but the pure pyridine which boils at 115 degrees C. with a specific gravity of .98 will dissolve crude rubber. C. O. Weber uses pyridine to separate asphalts, tars, etc., from the vulcanized rubber in analytical work. It might be a good accelerator, but its smell is almost unendurable.

Sulphur chloride, though not strictly a rubber solvent, is used for the cold cure. It has been described in Pearson's "Crude Rubber and Compounding Ingredients" and is familiar to all in the rubber trade.

In general those liquids which dissolve in water and not in oils are not solvents of rubber, but some of them are used for various purposes in the rubber industry. Methyl or wood alcohol will not dissolve rubber, but will dissolve resins to some extent. Ethyl or grain alcohol will dissolve most rubber resins better than wood alcohol, though the latter will dissolve shellac better, and most varnish gums can be dissolved better in these alcohols, if not raw, than after heating.

The higher alcohols, such as fusel oil, together with their esters such as amyl-acetate, will dissolve rubber quite perceptibly, but they are of no importance in the rubber industry though of great importance in the celluloid and like industries. Amyl-acetate is almost necessary in all nitrocellulose solutions to get a proper protective coating which is of the proper glassy consistency. Acetone is a better rubber resin solvent than the alcohols, but methyl and ethylacetates are still better solvents, in fact the best which will not dissolve the rubber at the same time. Many rubber solvents have not been mentioned as they are rather rare chemicals or oils of such high price that they are of no practical interest.

COAL TAR PRODUCTS FOR THE RUBBER TRADE.

THE ramifications of the rubber trade call for a wide variety of coal tar products. It might be well to consider the list of materials that are demanded by the manufacturers of various rubber goods:

BENZOL, which boils at the lowest point of all the coal tar distillates, is made in five grades.

BENZOL PURE is made water-white and refined so that 100 per cent. of it will distil within a 2-deg. C. range of the boiling point, 82 degs. C., and has a gravity of approximately .880. This material is crystallizable at freezing temperatures. It carries little in the way of impurities and a very small amount of higher boiling homologues. It is used chiefly in cements where speed of evaporation is required. It is also used as a carrier for sulphur chloride, sometimes alone, and at others mixed 50 per cent. with carbon tetra-chloride. There is a small percentage of sulphur compounds in the way of impurities, and certain sources of crude will yield a small amount of carbon-bisulphide in the resultant benzol. Of late there has been a demand for benzol free from these compounds.

100 PER CENT. BENZOL is water-white and refined to a similar degree as the preceding, except that higher boiling homologues are present in sufficient quantity to elevate the boiling point so that 100 per cent. will distil at 100 degs. C. It is used in about the same way as pure benzol.

90 PER CENT. BENZOL is the grade that is used most by the trade. This material is water-white, of good odor and very strong in solvent power. It is fast in evaporation and will cut rubber, rosin, gum, etc., with considerable speed. This enters into a wide variety of cements, particularly pure Pará. It has been used for "wiping off" in tire building, but as a usual thing the low cost of petroleum products precludes this.

50 PER CENT. BENZOL is similar to the preceding grades, but slower in evaporation because the boiling point is now elevated so that only 50 per cent. will distil at 100 degs. C. It is seldom used in the trade except in a few special cements where a certain drying time is required.

STRAW COLOR BENZOL is a grade of benzol comparable to 90 per cent., except that it is not refined enough to be water-white. It is used where the fact that it is pale yellow in color and rather stronger in odor than the water-white makes no difference. The coal tar solvents are higher in price than the petroleum naphthas, but they have better solvent powers, and in many cases superior evaporative qualities. For these reasons they are employed for many special purposes where the petroleum products are not suitable.

PURE TOLUOL is a water-white distillate boiling within 2 degs. of 110 degs. C. This would have similar properties to all the preceding benzols, but its high comparative cost precludes its use.

COMMERCIAL TOLUOL is water-white, boiling 90 per cent. at 120 degs. C., and of similar solvent power, but still slower evaporation. It is used only in tire doughs and such compounds where slow drying is required.

STRAW-COLORED TOLUOL is similar to commercial toluol except that the process of refining has not removed sufficient impurities to make it water-white in color. It is used when color and odor make little or no difference.

XYLOL is never used in the pure state by rubber manufacturers.

SOLVENT NAPHTHA is really Commercial Xylol—a refined water-white solvent, sometimes called "160-deg. Benzol" and "Rubber-maker's Naphtha." This is used for cements where slow drying is required. It is strong in solvent power; has a good odor and a fairly high flash point—78 degs. F. It is a similar grade to the coal tar naphtha used so much in England for spreading. It also enters very largely into the varnishes used in coating rubber goods, shoes, boots, etc.

HEAVY NAPHTHA has been used in insulating work and also in the preparation of packing and stuffing compound when used along with asbestos, fillers and other bitumens.

CREOSOTE OILS have been used as preservatives for ducking when they have a small percentage of carbolic acid present. They have been suggested for reclaiming purposes, but it is believed their wide variation in manufacture, due to change in source, would require an expensive treatment to insure uniformity.

CARBOLIC ACID is used somewhat as a preservative for duck and also in reclaiming. This process is now used with considerable success and is covered by patent No. 722,944, March 17, 1903, issued to Joseph Chautard and Henri Kessler, and United States Patent No. 774,727, November 8, 1904, issued to Ludwig T. Petersen. Cresylic Acid, often called "Crude Carbolic Acid," is utilized in a similar way.

REFINED TAR is simply a coal tar that has been distilled sufficiently to remove lighter hydrocarbons and excess of oils. It is added to reclaimed stock and shoddy to impart a kind of oily consistency and tarry odor.

NAPHTHALINE is made in a wide variety of refined crystals. The chief demand by rubber manufacturers is for white flake. This is used as a preservative and also for reclaiming. The process is, however, covered by a patent.

PITCHES, the solid residues of coal tar distillation, are used somewhat in compounding. It is extraordinary that these materials have not found more vogue in the trade, as they are hard, black, binding bitumens that can be easily made hard or soft as required. They are very cheap and easily obtainable. They melt well and will take up a large amount of loading material.

NOTE.—Gravity in coal tar distillates is unimportant as all are in the range of .880 to 1.04 and they do not vary in accordance with boiling point as in case of petroleum.

The Globe Tire & Rubber Co., Inc., has been organized at Philadelphia to take over the tire business of the Meeley Rubber Co., at 660 North Broad street. F. W. Darlington is president of the new concern, J. V. Harrigan and R. J. Skilton retaining their respective offices of vice-president and secretary-treasurer.

A NEW RUBBER AND ASBESTOS COMPOUND.

By John F. Green.

MANY attempts have been made looking to a compound of rubber and asbestos and the writer in pursuing his research of asbestos, both in the chrysotile and amphibole varieties, discovered that in external appearance and in chemical composition they are very much alike, and that the heat-resisting property of both these varieties of asbestos is approximately the same. But because of the condition of the fibre the amphibole is the best resistant to acid. The analysis of asbestos gives as component parts silica, magnesia, ferrous oxide, alumina and water, and the difficulty in the past to find greater uses for asbestos lay in the fact that for electrical and other uses the magnesia and ferrous oxide were found to be detrimental. The removal of the magnesia and ferrous oxide, however, gives what has been named "fibrous quartz," and this material has been spun into a thread, inducted into porcelain, made into paper and other uses; and the writer was asked to induct it into rubber—which has been done in all grades of rubber, and as high as 95 per cent. asbestos has been used experimentally.

It was discovered that vulcanization could be had at a lower temperature than that formerly used, that asbestos gave a greater heat resistance to the compound, and as we were inducting a silica with the compound we were getting a very hard material and one that would stand a great amount of hard usage. This fibrous quartz is non-carbonizing, impervious to acid, and is practically indestructible. Compounds made of low grades of rubber have been surprising in their results. No better adulteration can be found than fibrous quartz. Its utility, in addition to the other qualities named, gives this material a unique position in the commercial world.

The compound can be made of different per cents. of both ingredients to suit the requirements, but the compound thus far found best for common use is 75 per cent. fibrous quartz and 25 per cent. rubber.

In using asbestos as heretofore the 40 per cent. of magnesia going into the compound was a detrimental factor, electrically and in other ways, and results were not satisfactory. Besides, there were found more or less grit and sand in fine particles. All these objections are removed by the process employed to get the material known as fibrous quartz.

In all rubber manufactures, especially hard or semi-hard material, the product can be greatly improved by compounding with fibrous quartz, besides reducing the cost of production, and it will enable the product to find more channels commercially. The writer at present is engaged in experiments for a superior rubber for heavy truck tires, and for a compound that will resist acid for washing machines or wringing machines. He is also looking to a time when by these methods vulcanization will be greatly simplified, in fact, attained by friction—as in some of the experiments the compound under consideration was so tough that increased power was put on the machine and a scintillation of frictional vulcanization was observed.

REDUCED COST OF CEYLON RUBBER.

The annual report of the British Colonial office on Ceylon shows exports of rubber as follows: 1910, 1,698 tons; 1911, 3,060 tons; 1912, 6,628 tons, and 1913, 11,325 tons. Nine years ago the exports amounted to only 34 tons. In 1913, the United Kingdom took 55.38 per cent. of the total and the United States 23.89 per cent. The average value in 1912 represented \$1.77 per pound and in 1913, 80 cents. The relatively low cost of rubber production in Ceylon is referred to as permitting a satisfactory profit at prices now ruling. Recent railway extension will serve one of the richest rubber districts in Ceylon.

Some Interesting Letters From Our Readers.

TWO TIMELY LETTERS FROM THE FAR EAST.

DUTCH PLANTERS WANT TO SHIP DIRECT TO THE UNITED STATES.

THE following letter has been received from a large rubber house in Rotterdam which distributes the product of a number of rubber estates in the Dutch East Indies. These dealers are very anxious to make an entry into the American rubber market and their letter cannot fail to interest American importers and manufacturers. They write:

The reason why we take the liberty of approaching you is the following:

One of our firm is the manager of some of the best known rubber growing companies in our colonies, the Dutch East Indies. In this way we have the sale of the product of 5 estates in Sumatra and one in Java, and although these estates are still very young we are bringing more and more rubber on the market.

Since the British Government has declared rubber contraband our steamers are discharging their rubber in England or in France, and in order to escape the seizing of our product we will have to hold the rubber back in the Indies, or we will have to ship it to England or the United States.

England offers us the advantage of being near by, but we are considering whether the United States would not offer us a better outlet. There are advantages such as the facts that your country is the largest buyer of rubber, that direct shipment would save freight and insurance premiums, etc.

However, we know the English market, but we know nothing of that in the United States; and we would feel much indebted to you if you could give us some elucidations: if you would tell us whether plantation rubber is sold to the consumers by importers, or agents of English houses, through the medium of brokers, or how. Does there exist such a thing as a rubber market or rubber sale? And what are the expenses, import duty, storage expenses, brokerage, etc?

After England the Dutch people are the largest rubber growers, and we have dozens of companies, which are established here but are working in Java or Sumatra, that are in the same position we are in.

If the war is going to last long, as it most probably will, the Dutch companies will have to do one thing or the other, because, as set forth above, the rubber can no more reach the Rotterdam and the Amsterdam markets.

We have quite a number to suggest the idea of establishing an office in the United States for joint account of our companies, to sell our rubber direct, and we have considered the possibility that the Americans might work hand in hand with us to get a monopoly of the market, but we are afraid of taking the risk.

We would appreciate it if you would consider the above and give us your answer.

JOHN J. HARRIS, COMMANDER IN CHIEF, OF SCOUTS.
DEAR SIR:—I have the honor to acknowledge the receipt of your letter of the 29th inst. and in reply to inform you that the situation in the Far East is such that it is impossible for us to send a letter, such as you require, by the ordinary means. It is written in pencil, on a crowded sheet of paper (the camp stock of stationery being exhausted), and is not a very good specimen of the first class of writing. It is, however, for service in the British army. His letter is as follows:

I have been here in command of a post of cyclist scouts since

the war broke out, and have had no time to attend to business—in fact there has been no business to attend to. As I am a relic of the South African War (Strathcona's Horse—Canadians, you know), I was at once put on the first job going here. I volunteered for home at once, but no one is being sent from here yet, on account of climate, etc.

I have not seen THE INDIA RUBBER WORLD for nearly three months, and feel quite out of touch with your end of the game in the present state of affairs.

There is now the chance of a lifetime for American firms to buy rubber direct here in Singapore, and to establish direct relations with the center of production. Rubber was selling here at first (August) at 1s. to 1s. 6d. per pound—prime smoked sheet—but no orders could be obtained from anywhere. Where were your manufacturers? If they had had agents here they would have had the chance of a lifetime to lay in stocks on the ground floor.

I have been trying to persuade several American firms to start in to do business here direct, but they do not yet seem to grasp the definite limits of the local conditions. All rubber is sold here for spot cash, as estates send their rubber down here to obtain immediate money to carry on with, and any market that is established here will be on a direct cash basis—credits must be sent with orders. There is no money, and no credit to be obtained locally.

The Malay peninsula has exported from January 1 to August 31, 28,570 tons of plantation rubber and may be credited with 45,000 tons for the year. Ceylon will do about 15,000 tons, and the rest of the Middle East about 6,000 tons, or so, making a total of some 66,000 tons probable for this year.

TO THE EDITOR OF THE INDIA RUBBER WORLD, DEAR SIR:

We enclose for your inspection part of an issue of "The Waste Trade World," published in London. You will note that the article is copied word for word from your October issue. (The article referred to is the "Review of the Rubber Scrap Market," which filled about two-thirds of a page in THE INDIA RUBBER WORLD.)

Our grievance is that the London paper is not issued and sold exclusively to the trade, but is to be had by any Tom, Dick or Harry who cares to spend one penny.

We, as subscribers to your esteemed journal, also being wholesale merchants, trust this will have your kind attention, as we can assure you that the London paper is far from being popular with all our friends.

E. R. W.

England, October 29, 1914.

TO THE EDITOR OF THE INDIA RUBBER WORLD, DEAR SIR:

In your November number, page 115, you say that complaints have been received that Chinese rubber shoes are not worth as much as American rubber shoes for reclaiming.

There must have been a radical change in the last few years, for when I superintended the output of 4,000 pairs of Chinese shoes a day in Great Britain, this trade, along with the Turkish trade, demanded better stocks than the home trade, and it was understood that what would do for the home trade would not suit the Eastern market.

R. E. HOTCHKISS.

November 10, 1914.

Should be on every rubber man's desk—Crude Rubber and Compounding Ingredients; Rubber Country of the Amazon; Rubber Trade Directory of the World.

New Rubber Goods in the Market.

A MACKINTOSH CAPE FOR MEN.

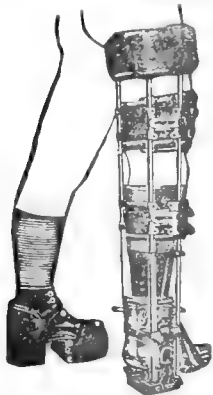
TWO views are here shown of the Hussar cape for men, a style popular in Europe but which has not until quite recently been made in this country. Its introduction here has been well received. It is made either in Mackintosh material or Cravenetted tweed and combines novelty with service and practicability. [The N. Y. Mackintosh Co., Mamaroneck, New York.]

A NEW GARTER FOR MEN.

A new garter for masculine use has recently come on the market that consists of an elastic silk strap to go around the leg, equipped with various fittings that are either made of ivory or of such a good imitation as to be indistinguishable from it. From this fact it gets its name, the "Ivory" garter. Its distinctive feature lies, however, in the method of catching and holding the stocking. There is a tongue, finished with a soft, corrugated rubber tip, that fits into a clasp. When the stocking is laid over this tip and the tongue pushed through the clasp the rubber tip holds the stocking absolutely and at the same time, being soft, avoids any tearing tendency. [Ivory Garter Co., New Orleans, Louisiana.]

AN AMBULATORY SPLINT WITH PNEUMATIC CUSHIONS.

Persons who have never suffered broken or fractured limbs or dislocated joints can scarcely appreciate the discomfort and inconvenience that often arise from these injuries, aside from the suffering they cause. One result of an accident of this nature might be, for instance, the shortening of the limb. To prevent such deformities and to promote as far as possible the comfort of the patient, a new form of splint has been devised, an illustration of which is shown. It is made of light, seamless steel tubes, with pads of webbing and flannel containing air cushions of rubber. These cushions enable the splint to be applied without pain. It is stated that this form of splint allows the patient to move and in bed, to sit up or to walk about at once; that it retains the broken bones in proper position, and permits frequent inspection of the injured member. [E. S. Betz, Hammond, Indiana.]

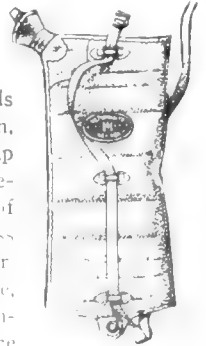


A MOTORCYCLE AMBULANCE WITH WATER-PROOF COVERING.

Not the least interesting of the inventions which the necessities of the present war have brought into being is the ambulance being used in the British army's hospital corps. A side stretcher with a third wheel is attached to the motorcycle. This stretcher is supplied with waterproof coverings to protect the wounded soldiers from the storms, and will accommodate two persons. Hundreds of these outfits are said to be in use, the high speed at which they can be operated being a feature of great advantage.

THE ABFOOT HOT WATER BOTTLE.

The hot water bottle shown in the accompanying illustration is a new type that has just come on the market. It is made of cloth-insertion chocolate colored rubber, and is considerably larger than the ordinary hot water bottle, measuring 18 x 8 inches, and will hold enough water to retain heat for a long period. One important feature of this bottle is the stays situated at regular intervals to prevent bulging and to maintain an even, flat surface. Another is the detachable strap arrangement by which the bottle may be secured to the body if desired. Or, by use of this strap the bottle may be attached across the foot of the bed, to serve as a foot warmer. The stopper is in the corner of the bottle, where it will cause no discomfort or inconvenience to the user, and the heating surface being unusually large, one bottle will ordinarily be found sufficient to provide the necessary warmth. [The Hospital Supply Co., 53-54 4th Avenue, New York.]

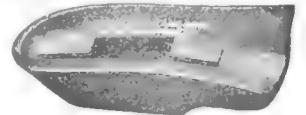


THE "MERMAID" BATH-TUB SYRINGE.

From the illustration it will be noted that the Mermaid syringe is intended for attachment to the faucet of the bath-tub. It is made entirely of rubber, from the soft rubber cup which slips over the faucet and the two and a half yards of red rubber tubing to the patented hard rubber medicating chamber and douche point. [Mermaid Specialty Co., 1416 Broadway, New York.]

THE KANGAROO ARCH SUPPORTER.

This is a scientific appliance for the support of fallen arches and is a distinct innovation in the field of arch supporters, being worn on the outside of the shank of the shoe, under the arch of the foot. The device for attaching it to the shoe is simple and practical. It consists of two clips nailed to the bottom of the shoe and two flanges projecting from the metallic anchors vulcanized into the supporter. When attached it has the appearance of being cemented to the shoe. It can be attached or detached in a moment, permitting one pair of supporters to be used on several pairs of shoes. It is made of rubber, is light, 5 ft. flexible, elastic and yielding, and permits the arch of the foot to rise and fall naturally. [The Dr. Neal Co., Portsmouth, New Hampshire.]



THE "WONPEACE" RING CUSHION.

The B. F. Goodrich Co., of Akron, Ohio, is making a new line of molded ring cushions, under the trade name "Wonpeace." This cushion is chocolate colored, all-rubber, absolutely without seam, has smooth surface and heavily reinforced edges.

A ROUND BALATA BELT.

Under the trade name "Dickbelt," R. & J. Dick, Limited, of Glasgow, Scotland, and Passaic, New Jersey—the makers of Dick's Original balata, gutta percha and canvas belting—are putting out a new line of round balata belting. This new belt is about three-eighths of an inch in diameter and is suitable for use

on sewing machines, certain kinds of washing machines, motor-cycles, in cash conveying systems in stores, on trolley cars for shifting the pole over the car, and for various other purposes.

BRUSH FOR APPLYING LIQUID POLISH.

The accompanying drawing shows the top and neck of a bottle—which may be either of glass or of metal—over which has been drawn a conical piece—or nipple—of rubber sufficiently pliable to fit closely over the top of the bottle. The extended end of this rubber cone has a back of sufficient thickness to give it stiffness, and at the same time thin enough to yield under pressure. The other half of this rubber cone is of softer consistency. A brush of horseshoe shape with a semicircle of bristles an inch and a half long is attached at the end. The purpose of this invention is to provide a quick and economical way of spreading polish either on a metal or leather surface. It may be used for automobile parts or for shoes. When it is applied the liquid polish in the bottle runs down into the cone and the pressure of the bristles on the surface to be polished forces the rubber cone backwards enough to open a small vent in the center of the bristles, through which the liquid feeds. [L. W. Bullard, Cumberland, Maryland.]

UMBILICAL TRUSSES.

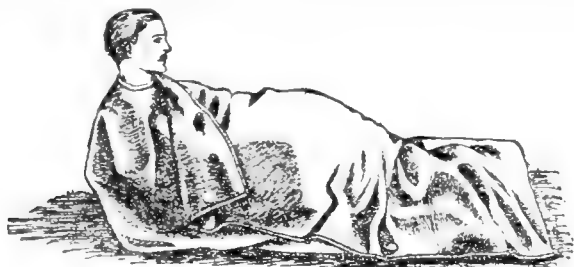
Below are shown illustrations of two new umbilical trusses, the first of which is made with a pad of sponge rubber, soft and comfortable to the flesh, and so arranged that it will not slip, also that it may readily be cleansed with soap and water.



The other, known as the "Walco," is made of double width elastic webbing with non-elastic straps in front, fastened to studs upon a polished hard rubber pad. It has soft leather trimmings and connections. Both are in adult size.

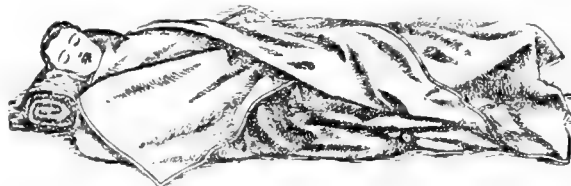
THE "OLIVA" SLEEPING BLANKET.

These two cuts illustrate a new style of sleeping bag, which is claimed to possess several advantages over the styles that have hitherto been on the market. One of these advantages is that it



has three thicknesses of material over the wearer, affording ample warmth, while another is that it can be thrown open in a

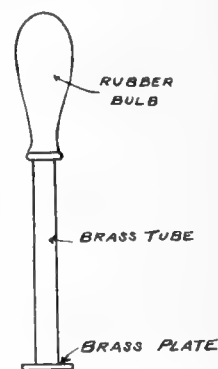
moment, as it is so shaped that it remains in position without the use of restricting fastenings, with the exception of the snap



fastening near the feet. Made of waterproof material, it is offered as especially suitable for use in field hospitals and hospital ships, as well as for those engaged in active service. [Mrs. Oliver, 39 Old Bond street, W., London.]

FOR LIFTING MICROSCOPIC COVER GLASSES.

A contributor to a London pharmaceutical journal describes a device which he employs for lifting the very thin microscopical cover glasses used in his research work. This utensil is shown in the accompanying drawing. It consists of a short brass tube in diameter about equal to a lead pencil, on the lower end of which is a flat brass plate with an opening in the centre, and attached to the upper end of which is a rubber bulb, such as is used on the ordinary medicine dropper or fountain pen filler. To lift one of these delicate glasses it is necessary simply to moisten the surface of the brass plate, press the rubber bulb, then press the plate upon the glass cover. The suction holds it in place. It can be released, of course, by again pressing the bulb.



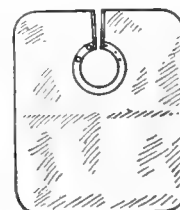
A WATCH CASE ATOMIZER.

This instrument is a complete and efficient pocket atomizer, suitable for spraying the nose and throat. It is made entirely of hard rubber, in the size and form of a watch case, and can be conveniently carried in the vest pocket, filled and ready for use; thus enabling sufferers from catarrh and similar afflictions to apply antiseptic spray at frequent and regular intervals. It has a screw-on cap, and is easily cleaned; is made in two styles—with fine spray for thin fluids and with coarse spray for thick fluids or oils—and is said to have the approval of the medical profession. [American Hard Rubber Company, 11 Mercer street, New York.]



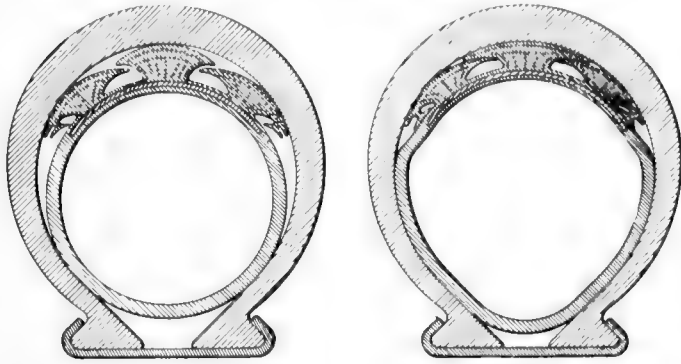
A SHAMPOO APRON.

Who has not experienced the disagreeable sensation, when indulging in an otherwise invigorating shampoo, of having water trickle down the neck? A rubber apron is now made which will prevent this annoying condition. This apron resembles a child's bib, but it fastens up closely around the neck, having a couple of snap fastenings so that it will fit different necks. It is made in several sizes, from 19 x 22 inches to 27 x 35 inches. [Bailey Rubber Co., Boston.]



A NEW INNER TUBE BY GUSTAVE KUSH.

Mr. Gustave Kush, of New York, the well known manufacturer of mechanical rubber goods, has invented an inner tube which certainly is unique and original. The first of the two accompanying illustrations shows this tube placed in the casing and only sufficiently inflated to hold its natural shape. It will be noticed that at the tread there are three longitudinal ribs, very much wider at the top than at their base. When the inner tube is fully inflated it assumes the shape shown in figure No. 2, where it will be seen that the



ribs overlap and form several chambers in which the air becomes compressed when the tube is inflated. This inner tube weighs about one-third more than the ordinary kind, but it will be possible with this tube to use a casing about 25 per cent. thinner than the usual casing.

It is obvious at a glance that this tube makes the tire much less liable to puncture than the ordinary tube which has the same thickness at all points. In addition to this merit Mr. Kush claims that by reason of the compressed air caught between the ribs and the decreased thickness of casing required the tire becomes more resilient. His further contentions are that there is no pinching or friction between the tube and the casing, and much less liability to over-heating. He believes, further, that with this tube pneumatic tires can be used on heavy trucks in place of solid tires to great advantage and with much economy. [Gustave Kusk, 61 Beekman street, New York.]

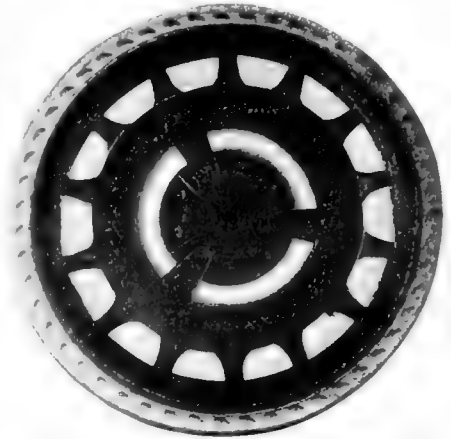
THE COATS RESILIENT WHEEL.

Many tires have been designed with the object of eliminating the pneumatic tube feature and preserving the resiliency, but the Coats wheel preserves the pneumatic cushion effect in a novel manner by distributing the air in six pneumatic bags placed around the hub. As shown in the illustration, each of these air bags is a circular cushion, placed between the hub and the rim. The rings are inflated simultaneously from an air valve near the center of the wheel, and are inter-connected by flexible tubes so that a road shock on one is distributed among the six. The rings are enclosed by cover plates on the sides of the wheel and are thus protected from oil, moisture and light. Should one of the cushions become deflated, the wheel could still be used, or the cushion replaced in a few minutes. Since the cushions do not come in contact with the road, they are not subjected to wear. The rim is made in S. A. E. standard sizes and will take standard solid tires. [American Motor Wheel Co., Crawfordsville, Indiana.]



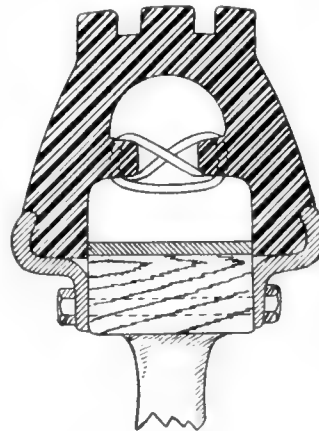
A PNEUMATIC TIRE WHERE IT CANNOT BE PUNCTURED.

A Louisville company has put a combination wheel and tire on the market of such a character that the tire, while pneumatic, is not subject to puncture, because it is far removed from where any puncture is possible. The wheel has a solid rubber tire. It also has a cushioned hub, consisting of an inner and an outer circle; and between these there is inserted an annular inflated cushion which, as a matter of fact, is a small size pneumatic tire, but, being placed where it is, it is immune from the accidents that befall the pneumatic tire in its usual place around the rim. The accompanying illustration shows the location of this new pneumatic. [Pneumatic Hub-Tire-Wheel Co., Louisville, Kentucky.]



THE SHERRIN-DIAMANT TIRE.

An innovation in the construction of solid rubber tires is presented in the Sherrin-Diamant tire illustrated herewith.

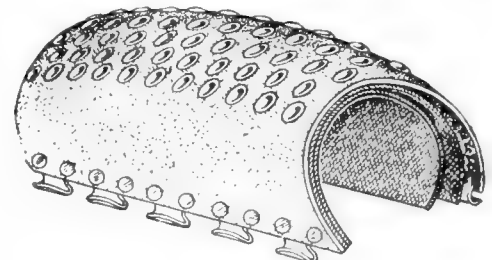


From external appearances it seems to be of about the same construction as the average solid tire, although it is said to combine the resiliency of a pneumatic with the advantage of being puncture proof. The inside is hollow and the lower edges set in the rim of the wheel in the ordinary manner. There are two ribs on the inside extending around the tire, and these are laced together by a raw hide thong, which supports the lateral walls but allows sufficient resiliency to take up the road

shocks. [The Sherrin-Diamant Tyre Syndicate, 10 Copthall avenue, London, England.]

THE "NO-STRETCH" TIRE BOOT.

A new type of tire boot, known as the K. C. "No-Stretch," has been introduced in the West. This boot is built on a core the exact shape of a tire, in quarter-inch sizes, so as to fit non-skid tires, and in both hook-on and lace-on styles. It is constructed of two inner layers of rubberized tire fabric and an outside layer of leather. The no-stretch feature is the result of the use of the rubberized fabric, which resists the action of water, while the studded leather cover supplies wearing quality. It is guaranteed by the manufacturers to give 2,000 miles service. [Western Tire & Rubber Co., Kansas City, Missouri.]



Some New English Rubber Goods.

THE Editor during his recent visit to England ran across a number of rubber articles which have lately come on the English market, but which as yet have not found their way, at least in any considerable quantity, across the water.

RUBBER SHOES FOR GOLFERS.

The accompanying illustration shows a pair of rubber shoes made especially for golfers, for in England and Scotland at least weather is no bar to golfing, and the game is pursued



ENGLISH RUBBERS FOR GOLFERS.

ardently even under dampening conditions. It will be noticed that these rubbers have steel studs in the bottom so as to render them anti-skid on slippery links. Another noticeable feature is the strap going over the instep of the foot, holding the rubbers firmly in place even when one is walking over soggy ground which has a tendency to pull them off. They are worn over any kind of leather shoes.

A RUBBER COVER FOR THE TOOTH BRUSH.

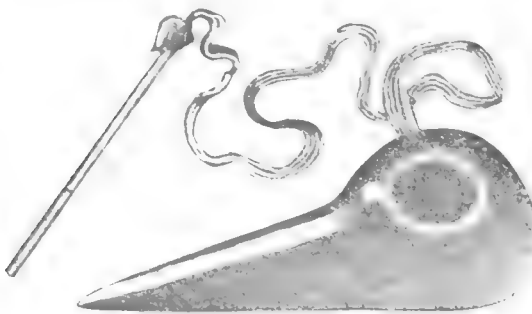
No one on packing his grip after spending a pleasant week-end likes to throw a wet tooth brush in with his collars and other accoutrement which it is desirable to keep dry. This little rubberized case solves the problem. The moist brush is inserted, the end clasped together, and no harm is done to the neighboring articles.



A WATERPROOF TOOTH BRUSH CASE.

A TEE THAT POINTS THE WAY.

The ordinary tee serves no real purpose except to place the ball on, so as to give it a clean, square blow; but the indicator tee which is here illustrated serves an additional purpose. It has a long pointer which indicates the proper direction for the stroke. It will be noted that the tee is fastened by a staple which is pushed into the ground, thus keeping the tee in position.

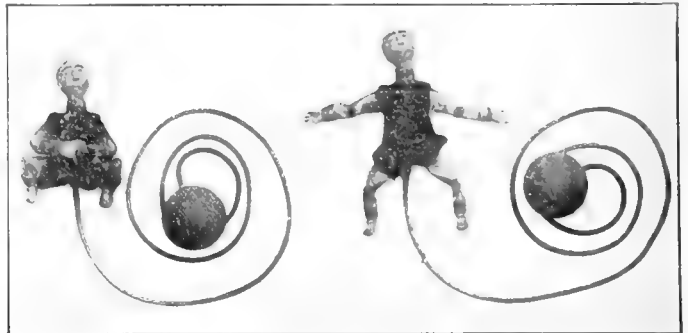


THE INDICATOR TEE.

A SWIFT AND UNTIRING SWIMMER.

Some rubber toys are so simple in their mechanism that everybody has made them without being able to get the idea

himself, but here is one of quite a different color, and on seeing it perform its functions one marvels at the human ingenuity that devised it. It is in the form of a little rubber figure, made hollow and so constructed that when in repose the arms and legs are folded up close together as in the left hand position in the accompanying illustration. To this little hollow figure there is attached, as a sort of caudal appendage, a long but slender rubber tube with a rubber bulb on the end. When the figure is put in the water its specific gravity is such that it floats with

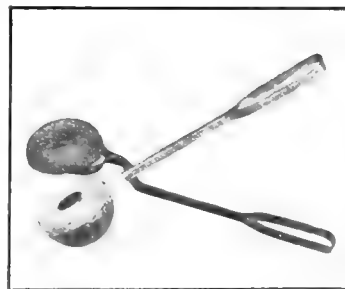


A RUBBER SWIMMER THAT REALLY SWIMS.

the head out of the water and the body submerged. A pressure on the bulb straightens the arms and legs as in the second pose in the illustration, and makes a perfect swimmer's stroke, so that the little figure darts ahead in the water with every pressure. To add to its realism it is clad in the conventional bathing suit. It is a droll device and affords infinite amusement.

A PNEUMATIC NOISE MAKER.

There are a great many people who think that there is too much noise in the world already, but that attitude simply argues advancing years. To the youthful mind there cannot be too much noise, and any addition to the existing sum is ardently welcomed. Here is a habit nee out of an English "Cracker," which is a device for making explosive sounds inexpensively and indefinitely. The two hemispheres shown in the picture are made of soft rubber. The flat surface where



A RUBBER CRACKER.

the two come together is made of wood or metal with a hole in the center. When a piece of paper is put over this hole and the two sides brought together by closing up the handle, and then either side of the completed sphere is struck against a wall or a table, or any hard substance, the pneumatic pressure breaks the paper with a loud explosion.

A SHILLING GOLF BALL.

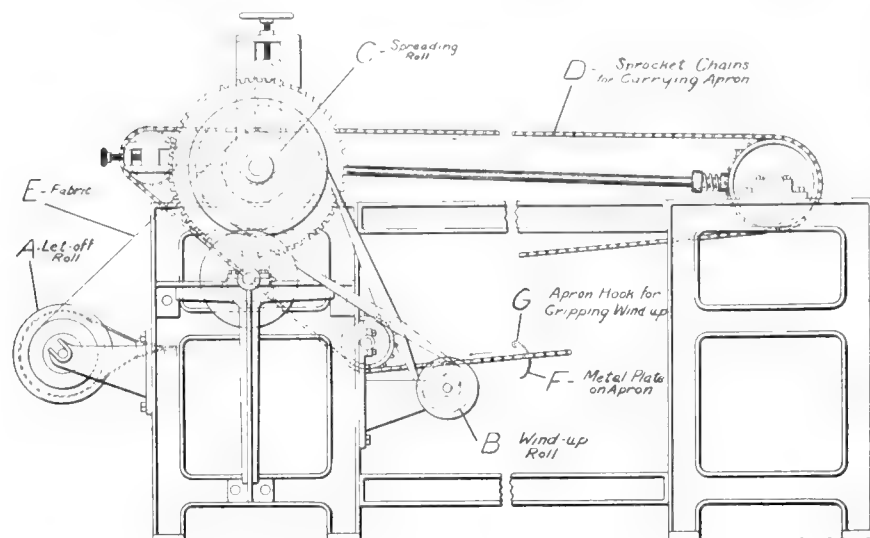
While in England recently the editor picked up a golf ball which is sold there for a shilling and called the "Sunbeam." This was not a re-made, but a new ball. Its cover was white as snow and very hard. The ball was a non-floater and flew well. At first it sounded a bit like the old "guttie," but seemed to loosen up after a little. Under the dissecting knife the interior proved to be a large ball of rubber substitute, wound with rubber tape, the cover being apparently of a celluloid compound.

New Machines and Appliances.

LANDIN'S FABRIC FEED FOR SPREADERS.

THIS is an ordinary spreader equipped with a device for feeding the fabric. This consists of an apron having hooks at one end and a clamping plate at the other, and is run by a pair of sprocket chains, into which the hooks catch.

In the drawing, *A* is the let off, *B* the wind-up, and *C* the spreading roll, driven in the usual manner. On each side of the



LANDIN'S FABRIC FEED FOR SPREADERS.

spreader is a sprocket chain *D* for engaging the apron to convey it through the machine to the wind-up. The apron is built up in the form of a pad, having two outer layers of canvas and a middle layer of felt. It is as wide as the fabric *E* and long enough to lap once or twice around the wind-up, forming a smooth cushion for the coated fabric. The apron is stretched between the chains and is not shown in the drawing.

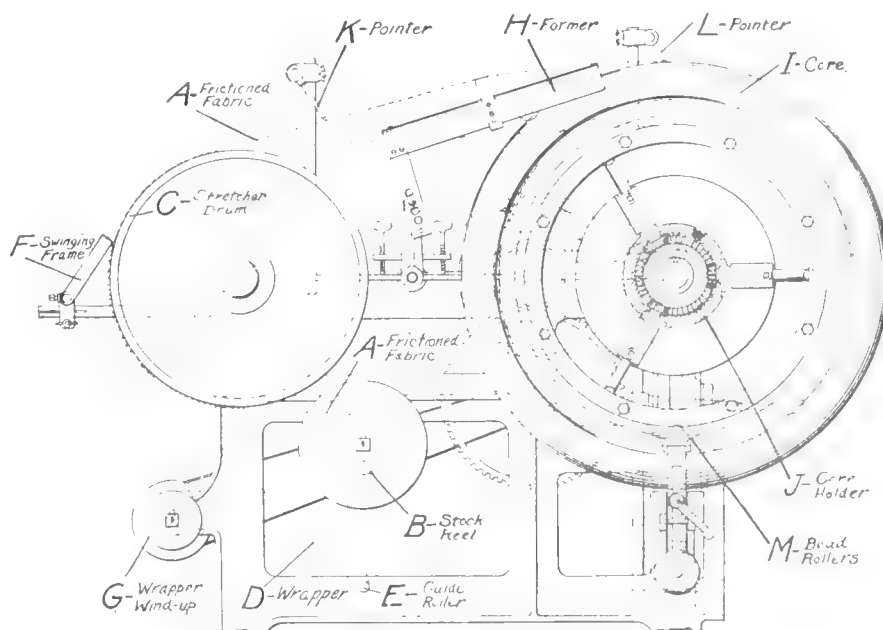
On the rear end of the apron is a narrow metal clamping plate to which the fabric may be quickly and smoothly attached. On its forward end is another metal plate *F*, curved to fit the wind-up roll. On each end of this plate is a hook for attaching the apron to the chains *D*, and in the center is another hook *G* which catches on one of a series of rods in the center of the roll *B* when the apron reaches this point.

The operation is as follows: The forward end of the apron is hooked to the chains and the rear end is clamped to the fabric. The spreading knife is raised and the machine set in motion. When the rear end of the apron has passed the roll *C* the knife is lowered and spreading begins. When the plate *F* reaches the wind-up it is automatically disengaged from the chains; the hook *G* catches one of the rods in the center of the roll *B*; the apron and fabric are then wound up in the usual manner. Invented by C. J. Landin, and assigned to the Clifton Manufacturing Co., Boston.

THE CONVERSE-KRESS TIRE MACHINE.

AMONG the new machines of the month is one for building tire casings. Its salient parts are a tire core and jack, a stretcher drum, a former for shaping the frictioned fabric to the core, and a pair of adjustable head rollers, all mounted on a frame.

Referring to the drawing, the bias frictioned fabric *A* is passed from the stock reel *B* around the stretcher drum *C*. The mesh wrapper *D* passes from the stock reel under a guide roller *E* but is again brought against the frictioned strip and passes part way around the drum with it, forming a brake to prevent it from being unwound too fast. The wrapper then goes over a swinging frame *F* and is wound up on a reel *G*. From the drum the fabric passes over a former *H* and is attached to the tire core *I*. The core, mounted on the holder *J*, is geared to travel 15 per cent. faster than the drum, to give the fabric strip a uniform stretch. The former *H* is shaped like an inverted U and has curved edges which turn up the edges of the strip to shape them for taking the beads. Above the frame are two pointers *K* and *L*, under which the center line of the strip passes, serving as a guide to keep the winding in line. A center line for this purpose may be marked on the strip as it is wound on the stock reel, so that the line will come on the upper surface of the fabric as it is unwound in the process of building up the tire.



THE CONVERSE-KRESS TIRE MACHINE.

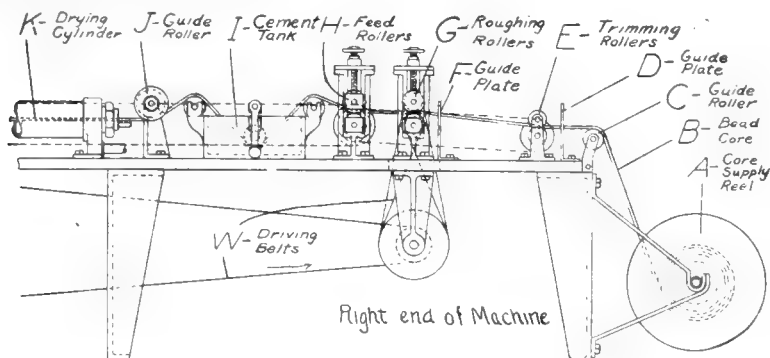
After the required number of plies are laid on the core the beads are applied and rolled into place by the adjustable, concave, horizontal rollers *M*. The machine is patented by F. B. Converse and F. A. Kress, and assigned to The B. F. Goodrich Co., of New York.

THE TYLER-NALL TIRE BEAD MACHINE.

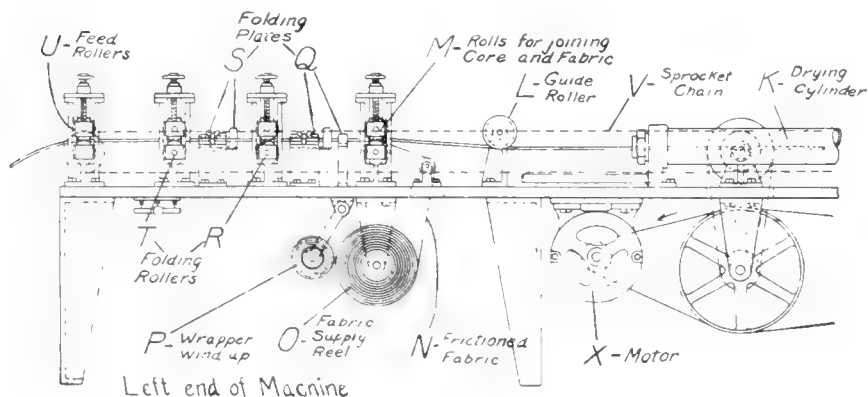
TIRE beads are usually made by hand. That is, the cores are formed by a tubing machine and afterwards covered with frictional fabric by hand. In the accompanying drawing is shown a machine for doing the cementing, covering, etc. It takes the bead core from a supply reel, feeds it through trimming rolls, through a cement tank, and then through a long drying cylinder. The strip of frictioned fabric is then folded longitudinally around it by a series of guide plates and rollers.

In the side elevation shown, the upper drawing is the right end, and the lower drawing the left end of the machine. From the supply reel *A* the core *B* passes over a guide roller *C*, through a guide plate *D*, and between trimming rollers *E*, where the surplus rubber is trimmed away. It then goes through a guide plate *F* and between roughing rolls *G* which prepare it for receiving a coating of cement. The core is passed between feed rollers *H* and through a tank *I* where it receives a coating of cement. From the tank it passes under a guide roller *J* and through a long, steam-jacketed drying cylinder *K*. Here the drying is hastened by forcing compressed air into the cylinder. From the dryer the core passes under a guide roller *L* and between rollers *M*, where it is brought in contact with the center of the upper surface of the strip of frictioned fabric *N* from the supply reel *O*, the muslin wrapper being wound up at *P*.

The core and fabric then pass through folding plates *Q*, rollers *R*, folding plates *S* and rollers *T*, which wrap the strip completely around the core and press it down firmly. The completed tire bead then passes between feed rollers *U* and away from



the machine. The various feed rollers, trimmers and folding rollers are driven through a sprocket chain *V* running the entire length of the machine, and belts *W*, from an electric motor *X*

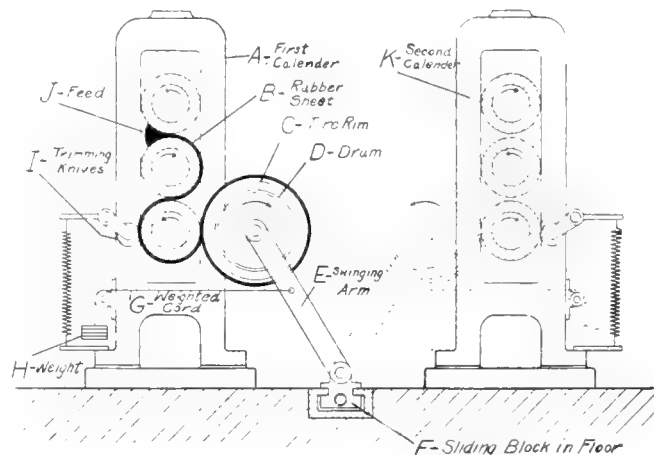


suspended by hangers under the frame. All driven parts are geared to feed the core at the same speed.

This machine is the invention of W. C. Tyler and E. Nall, who have assigned it to The Goodyear Tire & Rubber Co., Akron, Ohio.

GRAY'S SOLID TIRE MACHINE.

BUILDING up solid tires from sheeted rubber direct from one calender is not new. Building from two calenders, however, as illustrated herewith, of different qualities of rubber, is new and interesting, and is described below.



GRAY'S SOLID TIRE MACHINE.

The apparatus begins with a revolving drum holding the rim on which the tire is built. This is mounted on a swinging arm set between two calenders. The rim is pressed first against the lower roll of one calender and then against that of the second, and is built up in plies of two different compounds, sheeted and trimmed into a strip of the required width.

In the drawing, *A* is the first calender, in which the sheet *B* is produced for forming the base of the tire; the feed being at *J*. The rim *C* is mounted on the drum *D*, carried on the swinging arm *E*. The lower end of the arm is pivoted in a block *F* which slides in a groove in the floor. To hold the rim against the lower calender roll with sufficient pressure, a cord *G* carrying weights *H* is attached to the arm *E*. Back of the lower calender roll are two circular cutters *I* for trimming the sheet *B* into a strip of the required width. The machine is operated as follows:

The rim is swung over against the lower roll of the first calender *A* and is revolved by frictional contact with it, being held in this position by the weighted cord until the base of the tire is built up to the required thickness.

Where another quality of rubber is to be used in the tread, the arm *E* is swung over, bringing the rim with the partly-built tire against the lower roll of a second calender *K*. This is constructed exactly like the first machine, and the tread is built up in the same manner. In case more than two qualities of rubber are to be used, the drum is brought in front of other calenders by sliding the block *F* along the groove in the floor. The process is repeated until the whole tire is built up.

This is the invention of C. H. Gray, of the India Rubber, Gutta Percha & Telegraph Works, Silvertown, England.

William R. Perrin Co., with offices in Chicago, and factories at Argyle, Illinois, is putting a new type of vacuum dryer on the market. This company since the death of the late Mr. Perrin has been managed by Mr. Charles Johnson, its secretary.

YOUNG'S GRAVITOMETER.

THIS is a direct reading specific gravity balance for solids, liquids, pigments or other finely divided materials insoluble in water. The instrument is so designed as to eliminate all weighings and calculations, one balancing only being necessary for the determination of a gravity.

The operation of the balance for the determination of the gravity of a solid is as follows: With the balance leveled by

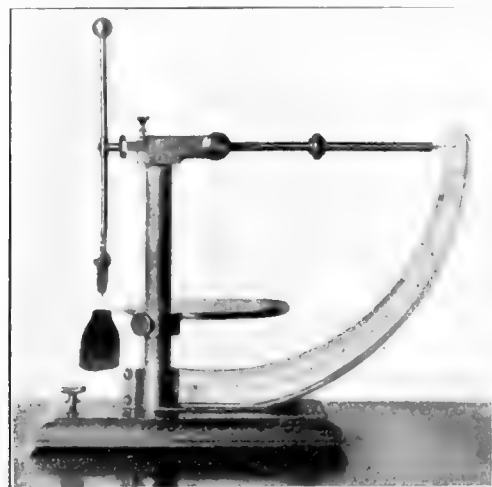


FIG. 1.

means of the thumb screw in the base, the sample to be tested is suspended on the hook or needle point and the weight moved to the position which will influence the pointer to register at 0° (infinity) on the scale. (Fig. 1.)

A beaker of distilled water is then placed on the swinging shelf which is brought into

position to allow the sample to be fully immersed, making sure that no air bubbles adhere to the sample. The pointer will then indicate the gravity of the sample to well within one per cent., whether the sample be heavier or lighter than water. (Fig. 2.)

In the determination of the gravity of liquids a sinker is used and the liquid gravity is read on a scale on the reverse side from the solid gravity scale.

For the determination of the gravity of pigments a receptacle is provided which is suspended in the place of the hook, and the operation is the same as with solids except for the use of a counterweight.

The "Gravimeter," which is now on the market, is the invention of Philip E. Young, of the Acushnet Process Co., New Bedford, Massachusetts, and full particulars may be obtained from him or from Emerson & Amend, of New York.

This balance is specially adapted for the rubber manufacturer, it being possible to determine accurately and quickly the gravities of all his products.

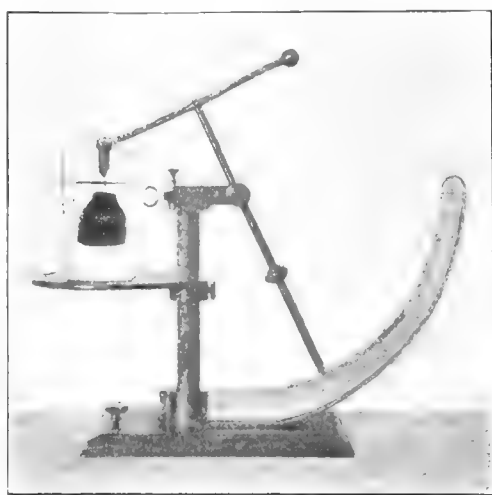
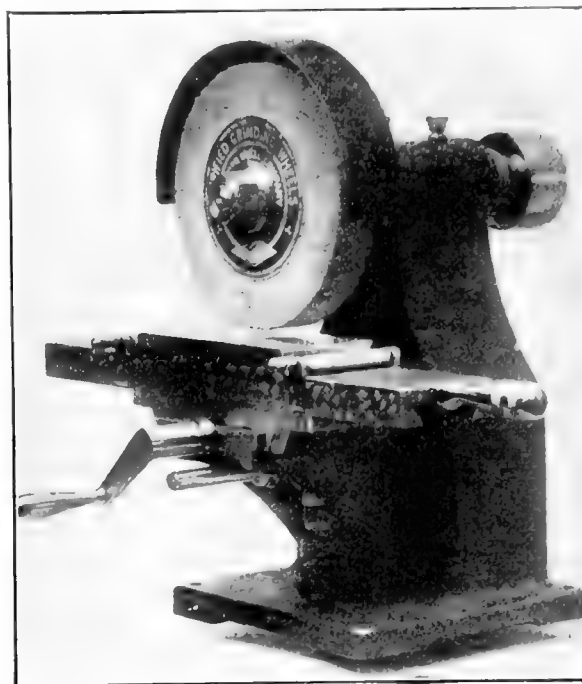


FIG. 2.

GRINDER FOR STRENGTH TEST RUBBER SAMPLES.

A NEW machine shown in the accompanying illustration has been gotten out for the purpose of preparing samples of rubber of a perfectly uniform cross section throughout the sample when the same are to be used for tests for tensile strength. This machine was designed primarily for the purpose of grinding the



rubber backing off of samples of rubber lining to hose before the lining was tested for breaking strength.

In preparing a sample of hose lining for test, a section of hose several inches in length is slitted along its length, and the interior lining with rubber backing is stripped from the fabric. This strip of rubber is cut to a uniform width of one inch throughout a distance of three or four inches along the middle of its length. The strip is then strapped closely to the platen of the grinder, and is quickly and firmly placed in position by the eccentric rolls shown in the cut. The strip is placed with the smooth side to the platen, leaving uppermost the rough side composed of the rubber backing to be ground off from the lining.

By means of the longitudinal, vertical and cross adjustments of the platen of this grinder, the sample may be quickly ground down to an absolutely uniform thickness throughout the entire length of the test section. This machine requires less than $\frac{1}{4}$ horse power for its operation, and is made up either as shown in the cut, or fitted with directly connected motor drive. [Emerson Apparatus Co., 251 Causeway street, Boston.]

OTHER MACHINES OF THE MONTH.

A new machine for wrapping strips of paper around finished tires consist of a horizontal, hollow, annular shuttle into which the paper strip is inserted in folds, thus eliminating the usual bobbin. The shuttle and tire revolve at right angles to each other, the strip being withdrawn from the interior of the shuttle as it is wrapped around the tire. [C. Kuentzel, assignor to The Goodyear Tire & Rubber Co., Akron, Ohio.]

Another new machine automatically cuts a sheet of rubber into strips with skived edges for making inner tubes. The calendered sheet is carried by an endless belt forming a moving table, under a series of circular cutters. These are set at an angle and slit the sheet into strips with skived edges, which are afterward cemented together to form the tubes. [E. Nall and W. C. Tyler, assignors to The Goodyear Tire & Rubber Co., Akron, Ohio.]

Should be on every rubber man's desk—Crude Rubber and Compounding Ingredients; Rubber Country of the Amazon; Rubber Trade Directory of the World.

COTTON NOTES.

LARGE INCREASE OF COTTON EXPORTS IN 25 YEARS.

OFFICIAL statistics of the United States exports for 25 years show that cotton shipments rose from \$251,000,000 in the fiscal year 1890 to \$610,000,000 for the same period of 1914. The exports during the 25 years reached a total of \$8,676,000,000. Exports of cotton manufactures increased from \$10,000,000 to \$51,000,000 in the time named with a total export in the period of \$708,000,000.

In the earlier years Europe took practically all the raw cotton exported, although of late Japan has taken considerable quantities. The total exports of American cotton to Japan in 1912 were about 240,000,000 pounds and in 1914 177,000,000 pounds.

A comparison of the exports of raw and manufactured cotton for the years 1890 and 1914 to the various grand divisions shows following results:

	1890.	1914.
Value of exports of		
Raw cotton	\$251,000,000	\$610,500,000
Cotton manufactures	10,000,000	51,500,000
Totals —		
Europe	1,400,000	8,000,000
North America	2,800,000	21,100,000
South America	2,700,000	3,800,000
Asia	1,700,000	9,000,000
Oceania	800,000	8,800,000
Africa	600,000	800,000

The cotton manufactures exported during the year 1914 included the following quantities, with their destination: China, 89,000,000 yards; Philippines, 86,000,000 yards; Central America, 36,000,000 yards; Cuba, 24,000,000 yards, Canada, 21,000,000 yards; British West Indies, 15,000,000 yards, and India, 14,000,000 yards. As a whole Europe took 7,000,000 yards; South America, 41,000,000 yards; Oceania, 95,000,000 yards; Asia, 125,000,000 yards; Africa, 9,000,000 yards, and North America, 138,000,000 yards.

Cotton imports during the last quarter century were valued at \$259,000,000, the largest part coming from Egypt.

While Asia exceeded North America as a market for American cotton goods in the aggregate for the last 25 years, North America, including Canada, British West Indies, Hayti, Cuba, Santo Domingo, and the Central American Republics is now the leading market for American cotton goods.

ACTIVE TIMES WITH NEW ENGLAND MILLS.

Large credit loans have recently been obtained by France and Russia, which are benefiting the manufacturers of New England, particularly those making cotton duck and hosiery as well as woollens.

According to report the French have secured credits for \$10,000,000, to which extent orders were placed which are keeping the New England mills busy. Many of these mills were already working overtime producing goods previously ordered, and the new orders will doubtless ensure their operation on a twenty-four hour schedule for weeks to come.

Just as the establishment of these large French credits was followed by the placing of large orders for the government of that country with the New England mills, so have the new Russian credits been the signal for like activities on the part of the agents of the Czar.

Philadelphia manufacturers have been laying in supplies of yarn from the smaller textile centers, which is an indication of prospects of future business encouraged by the low prices of yarns. That similar activity has not been witnessed in New England is caused by the unusually heavy buying from that quarter with the low prices during the early part of the war.

While the large stocks of goods on hand would have allowed the execution of these foreign orders a large proportion of the former are of a quality unsuited to the needs of the belligerent nations. It is, moreover, a question whether the amount of domestic material sold to foreign nations has been sufficient to affect the later

course of prices. Buying orders for the domestic trade which may result from a cold snap would make demands upon makers' stocks which they would be unable to meet.

Colored cotton goods have in some cases been taken off the market until supplies of colors become more assured.

BRITISH COTTON GROWING ASSOCIATION.

This association has made satisfactory progress during the last three years, the total quantity handled in its various sections being respectively: 1911, 60,800 bales (of 400 pounds); 1912, 71,400 bales; 1913, 78,800 bales. The operations of the association are in West and East Africa, Sudan and the West Indies. In the year 1914 it is anticipated to attain an aggregate production of 100,000 bales.

A project was launched at this year's Paris Cotton Congress for the establishment of a model cotton plantation in the Punjab district of India. The funds will be provided by a company with a capital of \$300,000. The Indian government has granted a free lease of 7,500 acres suitable for cotton, in proximity to the North Western Railway. A system of intensive cultivation will be adopted on the plantation.

REDUCTION OF COTTON ACREAGE.

It is announced that 33 counties in Georgia will make a combined reduction for 1915 equaling 42 per cent. of their acreage planted in cotton. In 15 of these counties the reduction was expected to be 50 per cent. or more than that proportion.

COTTON GINNING RETURNS.

In the government return from October 18 to November 1, ginnings are shown as 2,207,116 bales, bringing the season's aggregate to 9,828,695 bales, or 855,177 over that of same period last year. Sea Island cotton included in the above numbered 43,331 bales, compared with 42,804 bales to November 1 last year.

Ginnings by States to November 1 were as follows:

	Florida.	Georgia.	So. Carolina.
1911.....bales	21,038	33,841	1,684
1912.....	11,067	16,276	1,544
1913.....	16,356	24,570	1,878
1914.....	19,270	23,164	877

In four of the cotton States the figures to November 1 exceeded those of the last eight years.

EGYPTIAN COTTON ACREAGE REDUCED.

An Egyptian government decree reduces the acreage of cotton for the agricultural year 1915 by about 50 per cent., with a view to limiting the production to the requirements of the market, and thus maintaining a reasonable price for the crop. The decree provides that the maximum to be cultivated is to be 1,000,000 "feddahs" or 1,100,000 acres. Planting is entirely prohibited in the Upper Egypt basin. It is also prohibited for any owner or lessee to cultivate more than one-quarter of the area of an estate. Lands benefiting from summer irrigation will be considered as forming separate estates.

SEA ISLAND COTTON IN SANTO DOMINGO.

According to the report of the British Chargé d'Affaires at Santo Domingo, cotton shipments from that source decreased from 350 tons in 1912 to 247 tons in 1913. Though progress is not being made generally in the cotton growing industry of the island, there is a prospect of the plantation of Sea Island cotton established by an American company at that point turning out a success.

CANADIAN OPINION ON THE WAR.

In discussing the economic consequences of the war, the "Revue Economique Canadienne" remarks that the profits which may be made by Canadian factories in consequence of the precarious situation of European industries will only be temporary and will be insufficient to make up for the losses which Canada will inevitably suffer by the war.

NEW TRADE PUBLICATIONS.

A NEW RUBBER MAP.

THE Republic Rubber Co., of Youngstown, Ohio, has had prepared a world map which should be appreciated by the trade, for it designates, by special colorings and other markings, the rubber producing countries of the world and the rubber markets. It also gives the routes between the ports of the countries of production and sale, with the distance between these various points. The distance from Para to New York is thus shown as 2,900 miles, while the route from Colombo to San Francisco is 10,059 miles long and that from Colombo to New York, via the Panama Canal, is 13,361 miles in length—the distance between the Canal and New York being 1,961 miles. From Colombo to London by the Red Sea route and the Mediterranean is shown to be 8,000 miles, and by the southern course, touching at Cape Town, Congo River and the Cape Verde Islands, 12,000 miles. In addition to these features, the map attempts to show only the important divisions of the various countries and the chief cities, the special information it is intended to convey standing out clear and distinct.

PREVENTION OF ELECTRICAL ACCIDENTS.

In a neat booklet the Travellers Insurance Co. of Hartford, has alphabetically grouped a number of points in which foremen and others in positions of responsibility require to be on the watch for danger.

While these include general mechanical operations, some of them specially affect the rubber industry. Under the latter head comes the advice to electrical workers not to handle any electrical apparatus without wearing rubber gloves, which should be kept in good condition. Safety belts should be provided for men working on overhead lines and dark colored glasses for those obliged to look at intensely brilliant arcs. An experienced assistant should be always at hand to render aid in cases of emergency. The floors around switchboards and high tension apparatus should be non-conducting, and should be covered with rubber mats to provide effective insulation. Water should never be permitted to stand upon the floors in the vicinity of any electrical apparatus.

THE NETHERLAND CHAMBER OF COMMERCE IN AMERICA.

The eleventh annual report of the Netherland Chamber of Commerce in America, for the year ending March 31, 1914, has been issued, and contains much interesting matter as to the operations of the chamber on international questions in which the Netherlands is interested, as well as various details regarding the Dutch East Indies.

Forming the connecting link, geographically speaking, between the mainland of Asia and Australia, the Dutch East Indian Archipelago consists of a group of islands lying between the fifth degree northern, and the tenth degree southern latitude, and between 95 deg. and 140 deg. eastern longitude. The total area of these islands is about 587,370 square miles, and their population over 40,000,000, the principal islands being Java, Sumatra, Borneo and Celebes. In part this territory is under the direct rule of the Dutch government, while in other sections it is in the hands of native rulers, tributary to the Dutch Crown, of which they recognize the suzerainty.

Statistics for 1912 show the total investments in rubber in the Dutch East Indian Archipelago to have been \$83,654,390, made up as follows: British, \$57,496,170; Dutch-Belgian, \$14,398,395; French-Belgian, \$10,782,565; German, \$500,890; American, \$402,000; Swedish, \$74,370. The large amount of British capital was attributed to the "rubber boom" of 1910.

Various features of the industries of the Dutch Indies are dealt with.

EDITOR'S BOOK TABLE.

SLAVE STORIES IN RUBBER SEEKING. BY J. W. L. THE Walter Scott Publishing Co., Limited, London and New York. [8vo, 251 pages, cloth covers.]

TO those who consider that time lost which is not spent in some manner associated with the rubber business, this book offers an opportunity to carry their hobby into the realm of fiction; while at the same time it is not likely to lack appreciation from the general reader.

The book is divided into three sections and twenty-one chapters, each in itself a complete tale. The first section contains, under the title "Faltering Remains," twelve complete stories, most of which terminate tragically, including the tale of "The Rubber Fortunes Syndicate," which relates how John K. Bell, "an American optimist," and Joseph O'Hagan organized at Santander, on a basis of pure imagination, a £250,000 syndicate, in £1 shares, which in six weeks were five times oversubscribed in London; the result in the way of returns to the investors being practically viewed in the light of a tragedy. Then there is the story of "The Rubber King," Sir Peter Dinero, a self-made man, whose greed leads him to attempt a corner on rubber—an attempt of course frustrated by the hero of the tale, Captain Paul Marline, R. N., representative of the Rubber Investors' Committee. Captain Marline, as commander of H. M. cruiser, "Python," is also the hero of another story, "The Discovery of Gummer."

The most interesting chapter in the book to those concerned in the practical application of rubber to the needs and comforts of life will doubtless be the one entitled "A Rubberless World." While this is a dream story it brings a realization of how much more than is ordinarily appreciated we are dependent upon rubber. Starting with an office in Leadenhall street, where first a report is received of a rubber shortage and later that all the rubber in the city has disappeared, the dismay caused by the failure of the rubber office stamps to perform their usual office spreads when the elastic sides and rubber heels drop from the wearers' shoes; papers fall apart because rubber bands fail of their mission; erasers melt away; no telegrams or cables can be sent because the insulation has disappeared from the wires and cables; motor cars are put out of commission through the failure of their tires, etc., etc.—all ending in a vast conflagration which destroys the entire city, its suppression being rendered impossible by the absence of hose.

The second section is devoted to slave stories, under such titles as "For Sale—Two Hundred Souls"; "The River of Despair"; "Freedom's Dream," and "Milestones of the Dead," the last being taken from "John Bull," said to be founded strictly on fact and recounting the tale of torture inflicted on Africans in the caravan of one Don José Ricardo. One such victim, who fell sick and was unable to proceed further was pegged to the ground with a gourd of water within a foot of his lips, while his body, exposed to the intense heat of the sun, was covered with salted cloths intended to attract butterflies and bees; another, an old woman, had her wrists cut in little knots so that she would slowly bleed to death, and that she might die in comfort consistent with the civilization carried to that country by the gallant Don and his type, she was placed on an ant hill. Still another, a young girl, was suspended over a slow burning fire, from which she was rescued to tell this tale.

"The Bridge of the Incas," which appears in the third section, under "Patagonian Tales," is probably the most satisfactory story in the book, for in its nature comes to the aid of justice, the imagination of the writer producing a volcano which at just the right moment becomes actively eruptive, assisting the escape of the young lovers and at the same time consigning the villain to the fiery doom he so well deserves.

Replete with information for rubber manufacturers—Mr. Pearson's "Crude Rubber and Compounding Ingredients."

THE OBITUARY RECORD.

ALFRED BOOTH.

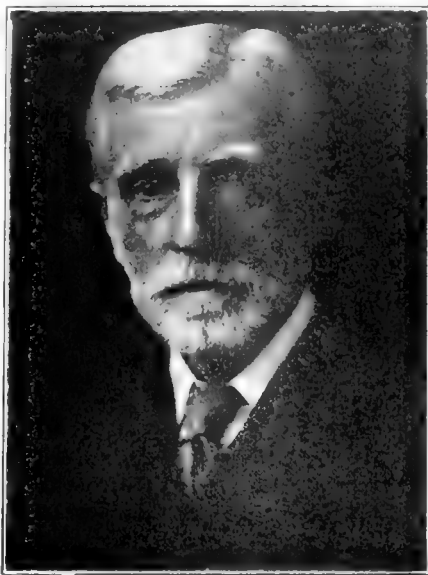
ALFRID BOOTH, head of the Booth line of steamships plying between Liverpool and the Amazon, and with a special service between New York and the Amazon (the foremost rubber carrying company anywhere in the world) died on November 1 at his home in Liverpool, England. While he spent by far the greater part of his eighty years in England, still he had so many interests in this country and came here so frequently in addition to the period of sixteen years during which he resided here—that he was widely known in American business circles.

He was born in Liverpool, in 1834, and while still a young man established in that city a company for the importation of leather for the manufacture of footwear; but he was not satisfied with this restricted outlook and in 1857, while but 23 years of age, he came to this country to embark on larger enterprises. He lived here until 1873 and in the meantime he established a large leather manufacturing company in Gloversville, New York—known for many years as Booth & Co. and now known as the Surpass Leather Co.—and also established the Booth Steamship Line, with steamers plying between New York and Para and Liverpool and Para. It was this particular enterprise that brought him in close touch with the rubber industry, as almost all of the rubber exports from Para to New York and Liverpool during the last forty years have been carried in the ships of this line. From a small beginning the operations of this company have increased until it has regular sailings four times a month from Para to Liverpool and almost as frequently from Para to New York; and some of its ocean going steamers penetrate the Amazon valley as far as Iquitos, over 2,000 miles from the Atlantic Ocean.

Mr. Booth was not only successful in the various commercial matters in which he was interested but he was well known in social circles in this country. He married, in 1867, the daughter of Benjamin F. Butler, Jr., at that time the leader of the New York bar, who a number of years earlier had been the law partner of Martin Van Buren and Attorney General in the cabinet of President Jackson. Mr. Booth is survived by his wife, six children and a number of grandchildren, all prominent in the social, commercial and philanthropic life of Liverpool and vicinity.

A. R. MACDOUGALL.

A. R. MacDougall, assistant superintendent of the Federal Rubber Manufacturing Co., Milwaukee, died at his residence in that city on November 20, from diphtheria, after a few days' illness. He was born in Nova Scotia, thirty-seven years ago, but went to Boston when he was twenty-three, and entered the employ of the Boston Woven Hose & Rubber Co., with which company he remained until 1912, when he went to Milwaukee to take an assistant superintendency in the Federal factory. He was highly esteemed by his fellow employees, and particularly by the workmen in his department.



ALFRED BOOTH.

MARGARET E. KNIGHT.

Miss Margaret E. Knight, who died at the Framingham Hospital some six weeks ago, was at one time a person of interest in the rubber business. Miss Knight had often been referred to in public prints as the "Woman Edison" because of the number of patents which had been issued in her name alone, or with co-inventors. It was said that she had many bright ideas on mechanical subjects but that most of her inventions were not mechanically or commercially successful until they had been perfected by others who were called in to assist her.

In 1879 she invented a machine for making square bottomed paper bags, which was sold to a corporation for a considerable sum and is in use today. It was several years later when she became interested in rubber shoe making, and in 1890 she secured two patents for machinery for cutting rubber soles from the sheet. It is, of course, known to the trade that such soles were all cut by hand, as the edges had to be on an angle or bevel. Between that date and 1894 she was granted eight or more patents for rubber sole-cutting machines. At this time she secured the interest of Colonel Lockwood of this city and Robert D. Evans, of the American Rubber Co. of Cambridge. Through their pecuniary assistance she was enabled to hire experts, and at last a practical machine was completed. This worked excellently in the shop where it was built, and it was installed in the American Rubber Co.'s plant in East Cambridge, where a number of prominent rubber footwear manufacturers were invited to see it in operation.

Such was Miss Knight's connection with the rubber trade. Her other patents (she is said to have secured over 80) run from a spit on which to roast turkeys, and clasps to hold a blanket over a truckman's lap, to window-frame sashes, boring tools and automobile wheels. Miss Knight was born in Manchester, New Hampshire, about 75 years ago, later residing in Springfield and Ashland, Mass., and for the last 25 years in South Framingham, where she occupied a stately old mansion in which she had her "workshop" and laboratory, where she spent much of her time in research and experiment, but making frequent trips to Boston or New York, where her experimental machines were built. She was a tall, robust woman, white-haired, but very active for her age. She had many law suits, but claimed that every one was decided in her favor. She had a shrewd faculty in securing financial backers to experiment and exploit her inventions. About four months ago she was attacked by a severe illness, and was removed to the Framingham hospital, where she died on October 13.

INFORMATION WANTED ABOUT ANDREW H. SMITH.

The Connecticut Mutual Life Insurance Co., of Hartford, has written to this publication to the effect that in 1887 it issued a policy of insurance on the life of Andrew H. Smith, who gave his address as New York City and his occupation as manufacturer of rubber goods. The company has not heard from Mr. Smith for many years, and thinks that he may have deceased. The insurance is still in force, and in case Mr. Smith is not living, and left heirs, the company is prepared to entertain a claim on the policy. If anyone in the trade knows Mr. Smith or can give any information regarding him or any possible heirs, the insurance company would be glad to get the information.

MR. BRADY'S RUBBER HOLDINGS.

The estate of Anthony N. Brady has been appraised at over \$77,000,000, of which amount over \$67,000,000 represents investments in stocks and bonds. He had the following large holdings in rubber companies:

In the Intercontinental Rubber Co. he held 589.60	
shares preferred, valued at.....	\$58,960
do 40,809.60 shares common, valued at.....	306,072
In the United States Rubber Co. he held 45,020.40	
shares first preferred, valued at.....	4,276,938
do 75,754.20 shares second preferred, valued at..	3,787,710

The Rubber Trade Association of New York.

THE formation of the Rubber Trade Association of New York with the election of officers and appointment of committees was mentioned in the November number of this journal. The Constitution and By-Laws have since been published under the general title:

GENERAL RULES AND REGULATIONS RELATING TO THE CONSTITUTION AND BY-LAWS OF THE RUBBER TRADE ASSOCIATION OF NEW YORK.

These rules and regulations are divided into a preamble and thirteen articles. The more important and interesting of these articles are given in full below together with a brief summary of the other articles.

PREAMBLE

I. The association shall be called "THE RUBBER TRADE ASSOCIATION OF NEW YORK."

II. The objects and purposes of the association are to foster and promote the best interests of the rubber trade as a whole for the mutual benefit of all concerned, importers, brokers, dealers and consumers; to reform any abuses relative thereto, to procure uniformity and certainty in the customs and usages of the rubber trade, to settle differences and disputes in the trade by arbitration, to promote a more enlarged and friendly intercourse between those engaged in the trade, and for those purposes to make and enact rules for the proper supervision and efficient conduct of the trade, including the regulation of mutual transactions between members of the association.

Article I states that any co-partnership, corporation or individual engaged in the business of crude rubber in the United States shall be eligible to membership. It refers to the obligation of the members to conform to the rules of the association. Each firm, co-partnership or corporation is only entitled to one vote in the association.

ARTICLE II.—MANAGEMENT.

The first section of this article is as follows:

SEC. I. The management and conduct of the affairs of the association shall be entrusted to a board of eleven (11) directors elected from members of the association in good standing, seven of whom shall constitute a quorum. There shall be elected by the board of directors each year from among those serving on the board a President, Vice-President, Secretary and Treasurer of the association.

The second and third sections refer to the terms of the various officers and the appointment of the various committees.

Article III describes the method of applying for membership.

ARTICLE IV.—MEMBERSHIP DUES AND FEES.

Sections one and two are as follows:

SEC. I. Initiation fee for membership to the association shall be \$25.00.

SEC. II. The annual dues shall be \$25.00 payable in advance on the first day of November in each and every year.

Sections three, four and five refer to the payment of dues.

ARTICLE V.—OFFICERS AND THEIR DUTIES.

SEC. I. The officers shall consist of a President, Vice-President and Treasurer and Secretary, who shall continue to hold their offices until their successors are elected and assume office.

The other sections describe the duties of the different officers.

Article VI.—Association Meetings—describes the place and time of holding meetings, the order of business and calling of special meetings.

ARTICLE VII.—VACANCIES IN THE BOARD OF DIRECTORS.

As indicated by the title, this article describes the procedure for filling vacancies in the board of directors and also for the removal of any director whose conduct is prejudicial to the interests of the association.

ARTICLE VIII.—ARBITRATION.

This article having to do with a matter of interest to the whole rubber trade is reproduced in full.

SEC. I. The Arbitration Committee shall, unless otherwise provided in the contract, have the power when called upon by a member or a non-member to arrange for a settlement by arbitration of matters in dispute between such member and any other member, or between a member and a non-member in connection with any business transaction entered into between them, and the following shall apply to all such references:

SUBDIVISION (a). The disputants or one of them, shall apply to the Committee for an appointment of arbitrators and the Committee shall thereupon appoint two arbitrators and an umpire, who need not necessarily be members of the association but at least one of whom shall not be a member of the Committee, for the purpose of settling the dispute. No arbitrator or umpire shall act in any case where he is interested in the subject-matter of the dispute, without the consent in writing of all parties to the dispute. A fee of \$25.00 in respect to such appointment shall be paid to the association by the party or parties to the dispute who shall apply for such appointment. Such fee, including arbitration and umpire fees, shall be ultimately borne and paid by the losing party, unless otherwise awarded.

SUBDIVISION (b). The fees for arbitrators or the umpire shall be \$10.00 each, but such arbitrators or umpire shall be awarded extra fees, in the discretion of the Arbitration Committee, if in the judgment of the Committee said arbitrators or umpire shall have performed unusual or extraordinary services during the arbitration on which they have served.

SUBDIVISION (c). In the event of the arbitrators being unable to agree on an award, they shall refer the dispute to the umpire.

SUBDIVISION (d). The umpire and arbitrator shall be at liberty to take such evidence and offer such documents in possession of the parties in dispute as they may deem necessary, and shall also have the right to require any of the parties to give such testimony in the matter in dispute as may be required, and for that purpose to require the attendance of the parties at such times and places as may be fixed for the hearings.

SUBDIVISION (e). Necessary costs and disbursements of the successful party, as well as the stenographic fees shall be paid by the losing party, unless otherwise awarded. An award of such arbitrators or umpires (as the case may be) shall be absolutely final and binding upon the parties for all purposes, unless the parties dissatisfied, forthwith, within three working days thereafter, lodge with the Committee a written notice of appeal, together with a fee of \$50, and serve a like notice upon the other party or parties to the dispute, in which case the Committee shall review the award and shall determine the rights of the parties.

SUBDIVISION (f). The Committee shall have the like rights and powers as are hereinbefore conferred on the arbitrators and the umpire for the purpose of enabling them to determine the rights of the parties, and their decision shall be absolutely final and binding upon all parties to the dispute. The said fee of \$50 shall be ultimately borne and paid by the losing party, unless otherwise ordered by the Committee.

If an arbitration covers a case where the seller has offered an allowance which the buyer has rejected, claiming that the allowance should be greater, and the arbitrators decide that the allowance should be equal to or lower than offered by the seller, the buyer shall be considered as the losing party and pay the fees. Such offers of settlement must be stated in the application to the Committee prior to arbitration.

SUBDIVISION (g). Members of the association, by signing the within rules and regulations, agree to submit their differences to arbitration as herein set forth, and to abide by the award. Any member of the association who refuses or neglects to submit any matter in dispute for arbitration or to abide by the award duly made, shall be suspended from privileges of the association in the discretion of the board of directors, and it shall be mutually agreed between all the members that such conduct on the part of any one or more members shall justify the others in dealing with such member only on a cash basis in the delivery of goods, supplies and materials used in the crude rubber trade.

SUBDIVISION (h). When a matter in dispute has been referred to the arbitrators or umpires (as the case may be) the said arbitrators or umpire shall require the party who considers himself aggrieved to file with it a written complaint, specifying the nature and grounds of his grievance, within the time fixed by them. Said arbitrators or umpire, after receipt thereof shall serve notice upon the member or person against whom the com-

plaint is lodged to make his answer to the same within a time specified, and the said party shall within the time cause an answer to be filed with the arbitrators setting forth concisely his reply to the matters set forth in the complaint. If there is no dispute as to the facts, the arbitrators may proceed to determine the matter under consideration without calling any witnesses or requiring any formal hearings. If from the complaint and answer filed by the disputants it appears that the facts in question are disputed, the arbitrators or umpire (as the case may be) shall then proceed forthwith to hear and determine the matter by calling the witnesses and requiring any further testimony that it may deem advisable in the premises.

ARTICLES IX TO XIII.

Article IX describes the method of expelling a member from the association should that ever become necessary. Article X covers the proper procedure in tendering all resignations. Article XI states the limitation of the authority of officers to contract debts for the association. Article XII refers to the interpretation of by-laws and article XIII to their amendment.

RUBBER SOLES AND HEELS.

The demand for rubber sole shoes has led a number of rubber factories to enter the field, among the largest of these being the New York Belting & Packing Co. This company's line embraces hundreds of different patterns of soles and heels, in qualities to meet all requirements, from the high grade "Indestructible" combination sole to the lower-priced all rubber article.

This company's large press room facilities enable it to meet all demands as to quick deliveries even in the height of the season.



Its experimental department is constantly working with a view to the improvement of the line, the feeling being entertained that for some classes of shoes, owing to the high cost and scarcity of leather, rubber soles will be used permanently.

The accompanying illustration is selected from a large bound volume of drawings showing the range of sizes of some of the styles most commonly called for. [New York Belting & Packing Co., 91-3 Chambers street, New York.]

FREIGHT RATES TO PACIFIC COAST CHANGED.

To meet water competition, the transcontinental railroads formerly made rates from New York to Pacific Coast terminals that were less than rates to intermediate points.

By an amended clause of the Act to Regulate Commerce, carriers are prohibited from charging more for a short haul than for a long haul. The railroads have therefore readjusted charges on less than carload shipments from New York to intermountain points, and have cancelled the former commodity rate.

The following are the articles upon which "less than carload" commodity rates from New York and eastern points to Pacific Coast terminals were cancelled November 15, 1914. On that date the class rates subject to Western classification went into effect on these articles, advancing the former rates:

Rubber boots and shoes, including tennis shoes (canvas tops) and felt boots; rubber coils, rubber discs for bottle stoppers; rubber, crude; reclaimed rubber or rubber shoddy; rubber tissue, rubber sheeting and rubber compound repair stock in sheet form; rubber rings for fruit jars; rubber spittoons; rubber springs, including rubber springs (or bumpers) for vehicles; rubber tiling; rubber tubing; tires (vehicle), solid rubber, attached to iron channels or rims; wire and wire goods, viz., wire, insulated or covered; wire rope or cable; wire telephone or electric light cables; copper wire, copper clad wire, copper rope or copper cable.

TRADE OPPORTUNITIES FROM CONSULAR REPORTS.

A Portuguese agent desires to secure automobile tires and equipment, etc. Correspondence should be in Portuguese or French. Report No. 14,216.

An American missionary hospital in the Far East wishes to be placed in communication with American firms manufacturing rubber goods and drug sundries. Report No. 14,249.

A large rubber manufacturing concern in Great Britain wishes to contract for regular consignments of 100 to 500 gallons of tetrachloride of carbon from American manufacturers. Report No. 14,304.

An American consular officer in the United Kingdom has been furnished with a list of electrical articles now finding ready sale in that country. This list includes electrical cables insulated with vulcanized rubber. Report No. 14,416.

A Portuguese firm wishes to purchase automobile tires. Correspondence should be in Portuguese or French. Report No. 14,419.

A company in the East Indies is prepared to export plantation rubber, either pale crêpe, smoked sheet or any other kind, according to the desire of the purchaser. Report No. 14,429.

A firm in Europe is in the market for pharmaceutical accessories, such as rubber tubes, etc., Report No. 14,430.

The Stavanger Elektricitetsverk, of Stavanger, Norway, is in the market for vulcanized rubber insulated wire according to the standard of the Verband deutscher Elektrotechniker of 1910, especially for 1½ square millimeters (0.002325 square inch) size. Samples should be forwarded and prices quoted by the 10,000 meters (32,808.3 feet).

A firm in Italy desires to purchase Brazilian, Bolivian and Peruvian crude rubber. This firm is in a position to handle considerable quantities and is willing to purchase on any terms, c. i. f. destination. References given. Correspondence should be in French or Italian. Report No. 14,381.

A company abroad has requested the American consul in that place to put it in touch with American manufacturers and exporters of ponchos, sleeping blankets and ground sheets combined. The inquirer understands that the type of article wanted is used by the American troops in the field. The firm has several branches throughout the country. Correspondence should be in English. Report No. 14,554.

GARDEN HOSE IN CONTINUOUS LENGTHS.

Corrugated reel garden hose in lengths of 500 feet or less, in sizes of ½, ⅝ and ¾-inch diameter, black or red, has been added to the regular line of smooth hose manufactured by the New York Belting & Packing Co. It is sold under the following trade marks: "Magic," "Delta" and "Jubilee Corrugated."

INTERNATIONAL EXPOSITION OF INVENTIONS.

Under the above title an exhibition is to be held from December 12 to 19, inclusive, at the New Grand Central Palace, New York, in the interest of inventors, who will have an opportunity of displaying inventions on which they have secured patents. American Institute gold, silver and bronze medals and diplomas will be awarded to those whose products combine, in the opinion of a qualified jury, the greatest measure of novelty and utility to the world with mechanical and commercial practicability. It is proposed, also, to organize, from representatives of the several associations of inventors and patentees in America, a Congress of Inventors, which will put on record the needs of their class and the injustice with which they are obliged to contend under present legislative conditions. Lectures on subjects pertinent to the interests of inventors and patentees generally will also be given in connection with the show and congress.

The British Embargo on Crude Rubber.

A Joint Committee of Manufacturers and Importers Appeals to Washington.

WHEN late in October cables were received in New York stating that England had placed an embargo on the shipments of crude rubber from any British colonial ports to any point except London, and when, about the same time, other cables were received intimating that the government was about to place an embargo on all crude rubber shipments from the home ports of England as well, the rubber trade of the United States was quick to realize the seriousness of the situation. A joint meeting was held on November 2 of the executive committee of the Rubber Club of America and a special committee appointed by the Rubber Trade Association of New York. As a result of this meeting a committee of manufacturers and importers was appointed, consisting of the following members: H. Stuart Hotchkiss, of the United States Rubber Co.; Arthur Marks, of The B. F. Goodrich Co.; George B. Hodgman, of the Hodgman Rubber Co., president of the Rubber Club of America, and Wm. E. Bruyn, president of the Rubber Trade Association of New York, who were to see what steps might be taken to relieve the situation. The committee at once got into communication with the State Department and brought to the attention of the Acting Secretary the great hardship that would fall upon the rubber industry of this country if this embargo were long to continue. The two letters sent out by the secretary of the Rubber Club to leading members of the trade, which are given below, indicate what has been done by the committee and how the matter now stands:

November 17, 1914.

Announcement was made on November 16 that the British Government had placed an embargo on all shipments of crude rubber from England in addition to that formerly placed on direct shipments from her colonies. This embargo seems to have been due to the re-exportation of crude rubber from the United States to the enemies of Great Britain.

The matter was taken up at once with the proper authorities at Washington by the special joint committee of rubber importers and manufacturers with a view to making some arrangement whereby these embargoes may be raised through a guarantee that the rubber will not be re-exported.

H. S. VORHIES, Secretary.

November 24, 1914.

The joint committee of rubber manufacturers and importers has been in constant touch with Washington and London since its report on November 17. It believes that it is working through every public and private channel available. So far nothing tangible has resulted and the committee regrets that it can only report that it will spare neither time nor expense in its efforts to relieve the situation.

As the matter now stands, rubber cannot be imported into the United States from any British port. England has the power to withhold her rubber from us. Until she is sure that her wants are fully supplied and is convinced that rubber coming to the United States will not be re-exported to her enemies, the embargo probably will not be raised. Your committee is working along these lines.

A joint committee has been appointed by the Rubber Growers' Association and the Rubber Trade Association of London, which is to confer at once with the proper British cabinet officer to ascertain if some arrangement cannot be made to lift the embargo. This committee is co-operating in every way with the joint committee of manufacturers and importers of the United States.

H. S. VORHIES, Secretary.

It need only be added that the situation is the same now as mentioned in the secretary's letter of the 24th. The British Government as yet has given no intimation as to its action.

OTHER APPEALS TO THE STATE DEPARTMENT.

In addition to the activities of the joint committee mentioned above, appeals have been made to the State Department from private quarters. Among these was one sent late in October by

W. L. Wadleigh, who recently established the firm of Wadleigh & Co., Limited, in Singapore, for the purpose of buying and shipping crude rubber direct to manufacturers in the United States. In reply to his letter he received the following communication from the Acting Secretary of State:

Department of State, Washington.

November 6, 1914.

Mr. W. L. Wadleigh, Sir: Referring to your letter of October 24, 1914, and to this department's reply of November 3, 1914, regarding the embargo against the shipment of crude rubber from British Colonial ports to the United States, you are informed that the department recently telegraphed the American ambassador at London, England, that American interests desire the lifting of the embargo on rubber, and requested the ambassador to ascertain upon what grounds this embargo had been instituted, and whether shipments might be allowed to the United States from Great Britain, her colonies and dependencies. A similar telegram was sent to the American Consul General at Singapore, Straits Settlements, with the additional statement that American importers would doubtless, if required, give a guarantee against the re-exportation of the raw materials received.

A telegram just received from Singapore states that the American Consul is awaiting information as to the grounds for the embargo and whether exportation to the United States would be permitted if a guarantee against its re-exportation was given. It is added that the exportation of gutta and jelutong is now permitted.

You will be advised when further information is received.

I am, sir, your obedient servant.

(Signed) ROBERT LANSING, Acting Secretary of State.

WHAT NEW YORK IMPORTERS THINK OF THE SITUATION.

New York rubber importers, when recently interviewed in regard to the British embargo, appeared to entertain somewhat different opinions as to its operation and effect. A member of a large importing house spoke as follows:

"It has been privately understood from the British consul that England has no desire to interfere with legitimate American rubber export trade. It is believed rubber shipped from the United States is reaching Germany through Norway, Sweden, Denmark and Italy. As soon as satisfactory guarantees can be made, and certified papers exchanged between the British consul and the consul of the countries to which the rubber is being shipped showing that it is a bona fide shipment to a non-combatant, the restriction will be removed. There is no question but London has plenty of rubber as evidenced by the recent reduction of price from 27d. to 25d. The embargo will be lifted in a few days, as soon as satisfactory arrangements can be made controlling United States shipments."

Another importer took a somewhat different view. Here is what he had to say on the situation:

"There is belief in some quarters that London is short of rubber and the embargo ruling is the result of England's desire to be assured that her rubber supply will not be interfered with. It does not appear from the strict watch the United States Government is keeping on rubber shipments that England can have any serious ground in believing that great quantities of rubber are reaching her enemies by way of the United States."

Another said that there was but little rubber in sight and no large cargoes afloat, and if he had any quantity of rubber on hand he would hold it for the advance which he believed inevitable.

H. M. Leake, Economic Botanist, United Provinces, India, has been appointed principal of the Agricultural College Cawnpore. He is a son of W. Martin Leake, secretary of the Ceylon Association, London.

Sweden's output of rubber shoes in 1912 represented 3,869,066 pairs, value \$2,128,997. Imports of rubber at Goteborg amounted in 1912 to 558,728 pounds, and in 1913 to 622,405 pounds.

MR. BUCKLETON'S HOME FOR BELGIANS.

MR. ERNEST E. BUCKLETON, president and general manager of the Northwestern Rubber Co., Liverpool, England, who has been spending a few weeks in the United States, is doing notable work for the Belgian refugees. It will perhaps be remembered that he knows personally the whole of the rubber trade in England and on the Continent. The suffering of the Belgians, therefore, not only those connected with the rubber industry, but the whole nation, appeal to him very strongly. As a practical measure of relief he has turned a large house he owns in Liverpool into a refuge for them. Here 31 are already accommodated and he ex-



ERNEST E. BUCKLETON.

pects shortly to be able to take care of 75. These people are of the better class of Belgians but are wholly destitute. They are fed very simply but well, and wherever possible shown how to help themselves. To further this work Mr. Buckleton made an earnest appeal to citizens of Akron, where he is well known, and generous contributions were at once forthcoming. In Trenton he also received a warm welcome, a club there, to which he once belonged, subscribing \$500 for a start. The funds that are thus collected are sent to the Belgian Consul at Liverpool. The manner in which these funds are expended is submitted in detail to the subscribers from whom they come.

With 200,000 Belgians in England at the present time, and nearly 700,000 in Holland, in addition to the five or six millions in Belgium, all of whom are destitute, the object is one that must appeal to everyone. Mr. Buckleton is by no means insistent upon Belgian relief funds being sent directly for his own work; indeed he urges that as soon as \$500 is collected it be cabled to the American Ambassador in London for the Belgian Relief Fund, as the wants are pressing and immediate. His argument in favor of this line of charity instead of the Red Cross is that the soldiers are clothed and fed by their own governments. The Red Cross is also supported by the governments, while the ill-clad, starving Belgians have no such aid.

When it was brought to Mr. Buckleton's attention that the

Rubber Club of America was raising a fund for the Red Cross (or for any other relief organization) he was most anxious that his many friends in the rubber trade should remember the Belgians. Donations sent to the Rubber Club, marked "Belgian Relief Fund," would go to that fund in general. Those marked "Belgian Consul, Liverpool, Account No. 8," would be applied to Mr. Buckleton's relief work.

Incidentally, it is interesting to note that this energetic, warm-hearted British-American is supplying yarn for hosts of busy knitters and lending a helping hand to distressed individuals of a variety of nationalities.

THE RUBBER CLUB'S RELIEF FUND.

UNDER date of November 11 the secretary of the Rubber Club of America sent the following appeal to the active and associate members of the club:

"The members of the club in the recent vote gave an overwhelming majority in favor of not holding our annual banquet this season, and instead making a contribution to the American Red Cross, or any of the other humane agencies, for the relief of the suffering caused by the war in Europe, as may be preferred by the donors.

"It is hoped that each active and associate member will contribute at least \$8—the price of the banquet ticket of last January—and as much more as he feels inclined to add. This is a voluntary contribution and not an assessment."

A somewhat similar letter, but going rather more into detail as to the expectation of the club in reference to this fund, was sent to the firm members.

CONTRIBUTIONS TO THE RUBBER CLUB RELIEF FUND.

In response to the letters sent out by the club's secretary, contributions to the amount of \$1,982 had been received up to November 25, including the following:

FOR THE AMERICAN RED CROSS.	
Arnold & Zeiss, 277 Broadway, New York.....	\$250
Roland H. Ballou, Treasurer Manhasset Manufacturing Co., Providence, R. I.....	100
Hood Rubber Co., Watertown, Mass.....	100
Fisk Rubber Co., Chicopee Falls, Mass.....	50
The Goodyear's India Rubber Glove Manufacturing Co., Naugatuck, Conn.	50
U. S. Rubber Reclaiming Co., Inc., 30 East Forty-second street, New York	50
L. Littlejohn & Co., 129 Front street, New York.....	50
Indiana Rubber & Insulated Wire Co., Jonesboro, Ind....	50
Mechanical Fabric Co., Providence, R. I.....	25
F. H. Appleton & Son, Inc., Boston, Mass.....	25
R. J. Caldwell & Co., 15 Park Row, New York.....	25
Federal Rubber Manufacturing Co., Milwaukee, Wis.....	25
Reading Rubber Manufacturing Co., Reading, Mass.....	25
Obalski & Sweeney, 24 Stone street, New York.....	25
Ed. Maurer Co., Inc., 80 Maiden Lane, New York.....	25
St. Mungo Manufacturing Co. of America, Newark, N. J..	25
The B. F. Goodrich Co., Akron, Ohio	25
Lee Tire & Rubber Co., Conshohocken, Pa.....	25
L. J. Mutt, Boston, Mass.....	25
Boston Belting Co., Boston, Mass.....	25
Republic Rubber Co., Youngstown, Ohio.....	25
Gutta Percha & Rubber Manufacturing Co., 126 Duane street, New York.....	25
	\$1,050

FOR THE BELGIAN RELIEF FUND.	
Hodgman Rubber Co., 806 Broadway, New York.....	\$100
Parker, Stearns & Co., Brooklyn, N. Y.....	100
INDIA RUBBER WORLD, 25 West Forty-fifth street, New York.	25
Acushnet Process Co., New Bedford, Mass.....	25
	\$250
Total	\$1,300

Besides the sums above noted, \$682 has been contributed by members of the club in lieu of tickets for the sixteenth annual banquet, which has been abandoned this season, which brings up the total to \$1,982.

Dedication of the Forsyth Dental Infirmary.

THE dedicatory services at the Forsyth Dental Infirmary in Boston on November 24, marked the realization of the dream of the late James Bennett Forsyth, as brought to consummation by his brothers, the late John Hamilton Forsyth, and the last surviving brother, Thomas Alexander Forsyth, all well known in the rubber trade as members and officers in the Boston Belting Co. This infirmary constitutes a lasting monument to the memory of the deceased brothers, and a philanthropy unique in history.

As has been previously told in this journal, the institution has for its object the correction and cure of dental and oral defects in the school children of Boston. It will care not only for tooth troubles, but also related oral conditions, including defective palates, adenoids, etc. All work, of whatever nature, will be performed at the nominal price of five cents a treatment, thus raising the institution out of the category of a distinctive charity.

The services last Tuesday were in the great infirmary room on the second floor, a room nearly 60 feet wide, 170 feet long and 27 feet high. Here was assembled a company which taxed the seating capacity. Many State and city officials, professional men, philanthropists and members of the medical and dental professions were present. The opening prayer was by Mgr. Splaine, the benediction by Bishop Lawrence. Between these were addresses by David I. Walsh, Governor of Massachusetts; James M. Curley, Mayor of Boston, and President Emeritus Charles W. Eliot of Harvard University, after which Mr. Forsyth, in his quiet, modest way spoke, as follows:

"Mr. chairman, ladies and gentlemen: It seems fitting that I should say a few words to you in regard to the origin and perfection of this new undertaking.

"The idea of providing an institution for the care of the teeth of the children of Boston and its vicinity was first conceived by my brother, James Bennett Forsyth, who died in the year 1909. In carrying out his wishes, my brother and myself desired to erect the infirmary in memory of our brothers, James Bennett and George Henry Forsyth. The building is therefore essentially a memorial foundation. While the consideration of its direct uses was constantly before our minds in its planning and construction, the idea that it was also a memorial has never been lost sight of. The building on this account embodies many artistic features usually lacking in buildings intended solely for hospital purposes.

"In the construction of this institution we have entered a new field. No other building of this character is in existence. The problems we have faced have been encountered for the first time, and for their final solution I have to thank our Building Committee of the trustees, who have given generously of their time, their thought and of their expert knowledge. To their devotion the building owes its evolution and the extraordinary perfection of its professional detail. To the mayor and city council of Boston thanks are also due for their judicious foresight in

the purchase of the land between the infirmary and the art museum. Such promptitude as they have shown in this connection cannot fail to act as a spur to other gifts to the city.

"It has been my wish that the infirmary should be as a home to the children, beautiful and cheerful; a protector of their health, a refuge in their pain. By making them healthier and happier I hope it may make them



THE FORSYTH DENTAL INFIRMARY, BOSTON.

grow to be better citizens of our beloved Boston. If this is accomplished, as I believe it must be, with the cooperation of the dental profession, I shall feel that the gift has been well bestowed."

The key of the building was then presented to Mr. Forsyth by the architect, Edward T. P. Graham—symbolic of the completion of the building and its transfer from the builder to the donor—and Mr. Forsyth in turn handed it to Dr. John F. Dowsley, D.D.S., President of the State Board of Registration in Dentistry, as the representative of the Board of Trustees of the Infirmary. Dr. Dowsley accepted the key with a brief, appropriate reply, after which addresses were given by Milton J. Roseñau, M.D., Professor of Hygiene, Harvard University; Donald M. Gallie, D.D.S., of Chicago, President of the National Dental Association; Edward McSweeney, Trustee of Boston Consumptive Hospital, and William J. Gallivan, A.B. M.D., Commissioner of Health, Boston, and Chief of Bureau of Child Hygiene.

Interspersed in the program were several chorus selections given by children from the school in Roxbury (a portion of Boston) where the four Forsyth brothers received their early education.

After the formal exercises, the building was thrown open for inspection, and during the remainder of the week thousands of persons visited the institution, praising the beautiful building and the philanthropic spirit which prompted its creation.

The building is wonderful, well worthy of its setting near the Art Museum, in the Back Bay Fens. The beautiful colonnaded

front of white marble with broad, high windows has an imposing entrance through a doorway flanked by huge bronze doors, one symbolizing "The Mother, the Giver of Life and Love," and the other "The Commonwealth, the Giver of Health and Learning." In the vestibule are bronze tablets, one bearing the memorial inscription of the donors, the other, the names of the trustees. The hall and stairway are of Siena marble, the ceiling of Onastavino tile. There are bronze busts of James Bennett Forsyth and George Henry Forsyth.

Passing by the secretary's office, the information department and the reception room, we come to the "Founders' Room." This is so beautifully decorated and furnished as to remind one of a baronial hall. A great fireplace of Carrara marble bears the Forsyth coat-of-arms in tiling. On the walls are paintings of personal and historic interest in the Forsyth family, and here are bronze busts of John Hamilton Forsyth and Thomas Alexander Forsyth, the donors. Mr. Forsyth's extensive private library occupies one side of this room. A lecture room occupies the left wing, capable of seating 250 people, in which it is planned to give popular lectures on dental and hygienic subjects. In the other wing are hospital accommodations for surgical patients, and rooms where teeth are extracted. Between these are the usual ante-rooms to the surgical department, and the clinical amphitheatre, a wonderful room, entirely of cement, so built that it can be completely flooded with hot water or steam for cleansing and sterilizing.

The entire building is of fireproof construction; there isn't a bit of wood in the structure itself, and but little in the furnishings, and that little is chemically treated to make it absolutely non-combustible.

On this floor is also one of the finest laboratory and research rooms, fitted with every contrivance to facilitate such work.

One flight up the marble stairway is the great room mentioned before, where 68 chairs for dental work are already placed, lighted through large plate glass windows fifteen feet high, while space is available for as many additional chairs if necessity demands. Some idea of the extent of this room may be realized by the statement that nineteen tons of linoleum were required to cover the floor.

The whole establishment is for children, and the lower floor has reception rooms, waiting rooms, cloak rooms and all conveniences specially adapted to the wants of children. The big waiting room, lined, ceiled and floored with tile, has a big aquarium in the center, a library of children's books at one corner and many little chairs and tables which can be moved around at will. On the walls in Delft tile are designs illustrating children's legends, some of which have already been published in this journal. They illustrate "The Dorchester Giant," a poem by Oliver Wendell Holmes; "Rip Van Winkle"; "The Pied Piper," and "The Golden Fleece." On this floor are the assembling rooms for the dentists, both the permanent staff and the visiting professionals. There is a sterilizing room where each of the 1,000 sets of dental instruments is sterilized after use.

The cost of the structure and its furnishings, together with the endowment to continue its mission in perpetuity, is between three and four million dollars; and all this benevolence is due to the broad, philanthropic spirit of one family, connected with the manufacture of rubber, in one of the oldest establishments of this industry in the world.

A TIRE-MAKING MACHINE COMPANY INCORPORATES.

The Delmon Tire & Machine Co. has been formed at Indianapolis, to manufacture a tire making machine and probably later to manufacture tires. The machine is the invention of Fred S. Delmon, who has been for a number of years engaged in the tire trade, and the plans of the company have been authorized capital of \$1,000,000 provide for the sale of the machine to tire manufacturers as well as for the manufacture. Horace C. Stillwell, of Anderson, Indiana, is president of the company, Fred S. Delmon, general manager, and John H. Holden, senior, treasurer.

THE RUBBER TRADE IN BOSTON.

By Our Regular Correspondent.

BUSINESS isn't exactly in the doldrums, but—if the program is permissible—it isn't exactly busy-ness. Like the general run of trades, we are feeling the results of the almost universal stringency. Then again, many branches of the rubber business are affected by weather conditions, and it doesn't require a report of any meteorological bureau to prove that New England has been basking in beautiful sunshine ever since last August, until a week ago; and makers of rain-coats and rubber footwear have been so mournful that even the heavy storms of the last few days haven't coaxed a smile on their features. However, automobile supply dealers claim that the fine fall weather has facilitated the wearing-out of tires, and that this has helped their trade. Makers of mechanicals are not over busy, and the druggist sundry people report fair trade. But every rubber man hereabouts is looking for good business from now on, with a reasonably active boom anticipated early in 1915.

Large amounts of money made in the rubber business are being used for the amelioration of mankind, and for the benefit of the public. The Forsyth Dental Infirmary, opened last month—a report of which will be found elsewhere in this number—is one of the institutions which bear out this statement. Almost across the street is the great addition to the Museum of Fine Arts, to be opened in January, which is a memorial to the late Robert Dawson Evans, and donated by his widow. Perhaps of far greater philanthropic importance is the Robert Dawson Evans Memorial Department of Clinical Research, which, beside what its name implies, gives each year a series of public health talks. More than 5,000 persons have attended these talks at the beautiful building in the hospital district, and this winter and spring the course will consist of almost weekly lectures on health subjects by leading specialists in the topics selected. The institution is doing great practical work in thus educating the public in the cause, prevention and cure of diseases and the preservation of health. Surely this is a splendid way to give back to the people some of the profits made in the rubber business.

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The Franklin Rubber Co., which is now at 105 Summer street, will soon remove to 134 Federal street, in the new Federal Building, where it will occupy a deep and spacious store on the ground floor. At present the fixtures are being installed, and it is expected that the company will be in its new quarters early in December.

* * *

The Needham Tire Co. is the title of a concern which has recently been incorporated under the Massachusetts law, with an authorized capital stock of \$350,000. It is intended to manufacture automobile tires and inner tubes at a factory it has secured in Needham. It is stated that the company has assurances of a definite market for a large output. The president is Mr. John S. Patterson, formerly with the Revere Rubber Co., and more recently president of the Patterson Rubber Co. of Lowell.

* * *

Frederick T. Ryder, well known in the rubber footwear trade, is now with the Revere Rubber Co. of this city and Chelsea, where he is giving his attention to the rubber sole and heel department. Mr. Ryder's interest in the rubber business dates back to the time when he was secretary for Deacon Converse, of the Boston Rubber Shoe Co. Later, with the United States Rubber Co., he became acquainted with the shoe wholesalers and rubber footwear distributors throughout the country. A few years ago he became general sales agent for the Apsley Rubber Co., of Hudson, this state. The Revere company is now making the "Spring Step" rubber heel, and also a line of rubber soles for leather shoes.

and a line of combined leather and rubber soles. Mr. Ryder will probably confine his activities, for the present, to forwarding the sale of these specialties.

* * *

Rubber soles are being used to a greater extent than ever before by New England shoe manufacturers. It is estimated that one million pairs of rubber-soled shoes will be manufactured in Lynn alone this season. Brockton, Haverhill, Auburn and other leading shoe centres are using proportionally large amounts of rubber soles, and manufacturers of these goods are rushing. There are also many soles used which have rubber as a component part, fibre, leather, etc., being used in greater or less proportions. Among the recent additions to this class of manufactures is the "Comporub Gum Fibre Sole," made by the Clark Rubber Manufacturing Co., of Franklin, Massachusetts.

* * *

Friends of N. Lincoln Greene of the American Rubber Co. of Cambridge, are congratulating him on the advent of a daughter, born Saturday the 14th of November.

* * *

N. P. James, of the Boston office of the Firestone Tire and Rubber Co., is to wed Miss Freda Phillips, of Dorchester. The engagement was formally announced last month.

THE RUBBER TRADE IN AKRON.

By Our Regular Correspondent.

THE business of the Akron rubber companies seems to be in a healthy condition, and to have been less seriously affected by the war than was at first anticipated. Several of the larger concerns have lately declared dividends at the usual rate, and others report that the past year has been one of unusual success.

The Miller Rubber Co., for instance, whose annual meeting of stockholders was held November 12, reports in a statement of business for the fiscal year just ended: "It has been our banner year. Sales were over two and a half million dollars, and the net profits, after allowing for depreciation on buildings, machinery and tools, and crude and finished material, together with paying 7 per cent. dividend on the preferred stock, and 10 per cent. on the common stock, were increased to \$528,000. The net earnings were about double those of the previous year, or 40 per cent. on the average stock liability for the year. We are adding 1,000 horse power to our power plant, and 75,000 additional feet of floor space, which will give us a floor area of six and one-half acres."

The following officers were re-elected: President, Jacob Pfeiffer; vice-president, C. T. Grant; treasurer, F. B. Theiss; secretary and assistant treasurer, William F. Pfeiffer. These officers, with J. M. Doran, comprise the board of directors.

* * *

The manager of the truck tire sales department of The B. F. Goodrich Co., S. V. Norton, made an address at the Motor Truck Convention held in Detroit recently, which was received with much interest. The subject of this talk was "The Causes and Effects of Overloading and Overspeeding in the Truck Tire Field," being a discussion of tire abuses, their cause and their effect on the wear and life of the tire. The Goodrich company has prepared a list of folders dealing at length with the common causes of tire abuse and with the remedies. These are intended for free distribution either from the Akron office or branches.

* * *

A reorganization of the Star Rubber Co., of this city, has been effected, the entire assets of the business being purchased at receivers' sale and all obligations assumed by the new concern. The officers of the company as reorganized are: President, George W. Carmichael; vice-president, J. W. Miller; treasurer, W. E. Wright; secretary and general manager, E. M. Caldwell.

The superintendent and sales manager, M. B. Clark and G. E. Hall, were associated with the old organization, while Mr. Caldwell, the manager, was for several years sales manager of the drug sundries department of the Miller Rubber Co. The company has arranged for a number of new distributing agencies in the United States and abroad, and reports that, while general business is somewhat dull, orders in hand are sufficient to keep the factory in full operation, and that prospects are exceptionally bright.

* * *

A considerable amount has been raised for the relief of the Belgians. George D. Bates, vice-president of the First-Second National Bank, is chairman of a committee of eight Akron business men and manufacturers engaged in raising funds for this purpose. Three members of this committee are F. A. Seiberling, president of The Goodyear Tire & Rubber Co.; C. B. Raymond, of The B. F. Goodrich Co., and A. Adamson, of the Adamson Machine Co. This committee came into being through the activities of Mr. Ernest E. Buckleton, president of the Northwestern Rubber Co., of Liverpool, who has long been a personal friend of Mr. Bates and who recently visited Akron in the interest of this fund.

* * *

The Gregory Rubber Co., one of Akron's smaller but thriving rubber concerns, which makes a specialty of toy balloons for advertising purposes, will move about December 1 to 144 North Union street. The demands of increasing business have necessitated this move, and in its new home the company will have three times its former floor space, with double its old capacity. A line of rubber novelties for advertising, souvenir and premium purposes is soon to be added to the factory output.

* * *

The Goodyear Tire & Rubber Co. has just closed a very successful season, its sales for the fiscal year just ended being reported as 35 per cent. in advance of those of the previous year.

The sales convention held by this company from October 29 to 31, and which received brief mention in the November number of THE INDIA RUBBER WORLD, was attended by about 500 salesmen and branch and district managers. Following the usual procedure in such events, visits were made to the factory and addresses were made and discussions entered into on subjects particularly pertinent to the promotion of sales. Among the speakers at the convention were F. A. Seiberling, C. W. Seiberling, W. E. Palmer, H. S. Quine and W. D. Shilts—all officials of the company—C. H. Carlisle, of the Goodyear Canadian company, and C. C. Hopkins, of Lord & Thomas. Three special trains brought these representatives to Akron, and one feature of their visit which made a distinct impression upon the residents of the city was the parade from the hotel, across the city, to the Goodyear plant. The California representatives brought along as a mascot a real live bear, which attracted considerable attention ambling along in the procession; the men from the Chicago district were made up as minstrels, and the Southerners were in costume suitable to the climate of the South.

Of the 500 acres of land purchased two years ago by this company for the purpose of building homes for its employees at moderate cost, about 100 acres have so far been improved, divided into 432 lots of 50x100 feet and over. The 111 homes built about a year and a half ago have all been sold, building operations have been continued, and many lots have been purchased for homes to be erected next year. A block of 5 acres is to be laid out for an athletic field, and another of about 28 acres is to be devoted to a park system, probably to be later turned over to the city. Schools and churches have also been provided for, and the sale of intoxicating liquors within this district is forbidden.

* * *

The Akron Auto. Show will be held in the new O'Neil Building, at the corner of Church and South Main streets, from December 12 to 19.

Mr. Holcomb, of the Kelly-Springfield Tire Co., is able to be back at his office after a continued and severe attack of inflammatory rheumatism.

C. N. McCreery, of Akron, has been appointed assistant manager of the Western district of the Goodyear Tire & Rubber Co.

C. A. Dunham is in charge of the sales of the Cleveland territory of The B. F. Goodrich Co.

* * *

Frank J. Breiner, for 25 years an employe of the Whitman & Barnes Co., of this city, died November 16 in Winterhaven, Florida, after a brief illness. He was born in Akron in 1856. He is survived by his wife and three children.

William Smith, manager of the National Tire & Rubber Co., of East Palestine, Ohio, died at his home in Salem, Ohio, November 17, of heart disease, at the age of 54 years.

THE RUBBER TRADE IN RHODE ISLAND.

By Our Regular Correspondent.

THE past month has witnessed a gradual, though possibly slow improvement in the general conditions in the local rubber situation. More operatives have been called into the factories because of additional orders, and the restoration of confidence and the normal effect of approaching winter on footwear goods. The most noticeable effect, however, was attributable to the lowering price of crude rubber to a considerable extent, due to the destruction of the German commerce destroyer "Emden" and the bottling up of the "Koenigsberg." Immediately following this news being received, there was a decided lessening on the tension which had controlled the market, and local factories were assured of the stock necessary to complete orders, or to meet future demands. Whereas there were only about 50 per cent. of the rubber workers throughout the State under pay at the beginning of November, the close of the month finds upwards of 65 to 70 per cent. employed, with promising prospects of many more joining the active ranks in a short time.

* * *

Among the concerns in this vicinity that have been directly benefited by the European war is the Atlantic Tubing Co., Knightsville, through the demand for its flexible metal tubing. The largely increased orders for these goods, which heretofore have been largely imported from Germany, has resulted in this department of the plant being operated evenings, with prospects of a continuance of night work for an indefinite time. Much secrecy is maintained by the company, not only as to the methods used in the manufacture of this flexible tubing, but also in regard to the machinery used and the destination of its large shipments.

* * *

The affairs of the Walpole Tire & Rubber Co. continue to have special interest in this vicinity through the close connection with the suspended Atlantic National Bank of this city; in fact the claims of the Atlantic bank are among the heaviest liabilities of the Walpole company. At a recent hearing on the claims of the Atlantic bank before the special master, Emory J. Gibbs, at Boston, who was appointed to hear claims against the Walpole company, the amount accredited to the bank was considerably increased. The hearing was held on the motion of the counsel for the receivers of the Walpole company, who wanted the claim of the Atlantic bank cut down about \$3,000. Counsel for the bank, however, made a counter-motion that the claims of the bank against the Walpole company be increased by \$2,500. Later the receivers of the Walpole company withdrew their motion that the claim be decreased, and consented to allow the increase asked for. This means that the Atlantic National Bank

now has a claim against the Walpole Tire & Rubber Co. amounting to \$168,000.

* * *

The manufacture of carriage cloth at the factory of the International Rubber Co., at West Barrington, is up to the average of the busiest season of the concern. There are plenty of orders on hand, and to fill these contracts it is found expedient to operate a portion of the calendaring department at night. There is said to be work enough for several months in sight.

* * *

A number of important changes and improvements are being made at the factory of the National India Rubber Co., at Bristol, which means increasing by a large quantity the production of lawn tennis shoes. The plans call for a considerable outlay of money, but the indications are that with the tennis shoe industry of the United States Rubber Co. concentrated at Bristol, the activities at that plant will be materially increased. During the month several changes have been made in tennis lasts.

A new storehouse is being arranged in the center of the plant, a three-story building formerly used in connection with the packing department being utilized in the improvement. A new brick structure is being erected at the north end of the factory to connect the new machine room with the next building, which is used as a stitching room.

Among the wealth of floral tributes at the funeral of Miss Beatrice Colt, daughter of United States Senator LeBaron B. Colt, and niece of Samuel P. Colt, president of the United States Rubber Co., was a massive standing wreath and base made of orchids, lilies-of-the-valley, and pink roses, which was sent by the 2,000 employes of the National India Rubber Co. It was about seven feet in height. A large and beautiful basket of pink roses was sent from the officers and salesmen of the company, and a large standing wreath and base of roses and other flowers by the clerks in the office.

Col. Samuel P. Colt has recently purchased two estates at Poppasquash, which he intends to improve and add to his holdings in the vicinity of Mill Gut, which the land adjoins. One estate contained more than twenty acres and the second about twelve acres.

Among the nearly 2,000 individual firms and corporations to affiliate themselves with the Providence Chamber of Commerce during the membership campaign, recently held, were Hope Rubber Co., the Hayward Rubber Co. and the Davol Rubber Co. Other concerns were previously enrolled in the membership list.

* * *

The Revere Rubber Co., of this city, the local factory of the United States Tire Co., has been operating its plant overtime for several weeks because of large orders received from the several countries that are banded together in the great struggle against Germany and Austria-Hungary, and expects to be favored with many more large contracts. Harlow W. Waite, the local manager, has recently been in New York in this connection, and states that a number of large shipments of automobile trucks and solid tires for the Allies in Europe are now being contracted for, one including 6,000 solid tires being for practically immediate shipment. This, it is claimed, is too large for one concern to handle in the short time allowed before the delivery must be made. As large shipments have already been made from the Revere factory here, the solid tire department having been working overtime for a considerable period, Mr. Waite states that he expects the local concern will get a good-sized third of the order.

* * *

A creditors' petition in bankruptcy was filed in the United States District Court, in this city, on October 26, against the Cataract Rubber Co., having an office on Exchange street, in the National Exchange Bank Building. Robert S. Emerson was appointed receiver for the estate by order of Judge Arthur L. Brown. It is alleged in the petition that the company

admitted in writing its inability to pay its debts. The petitioning creditors, with the amounts claimed due, are as follows: Manhasset Manufacturing Co., \$3,432.07; Frank A. Cushing, \$259.50, and Blackstone Webbing Co., \$479.13. The Cataract Rubber Co., it is stated, is not connected with, and should not be confused with the Cataract Tire Co., at 49 Broad street, this city.

THE RUBBER TRADE IN CHICAGO.

By Our Regular Correspondent.

THE rubber trade in this city has been in a rather uncertain condition for the past month. In some respects general business conditions have been favorable; in others they have been adverse. The situation in the Far East has been subjected to close and constant scrutiny by the trade here. The rubber men realize that they must look in this direction for price conditions, and they are gauging their own plans by developments in that quarter.

Word of the sinking of the German cruiser "Emden" in eastern waters recently caused a much easier feeling in the rubber trade here, not because of any sentiments which might be classed as unneutral, but because this elusive man-of-war had been raising havoc with rubber shipments out of Singapore and other eastern ports.

The mild weather has not been good for the rubber clothing trade, and dealers handling these articles are in no better position than they were a month ago when the situation was given a canvass. They are certain that real winter weather, with plenty of snow, rain and slush, will cause a rapid improvement in the situation, and they are also sure that such conditions cannot be far away.

The capacity of W. H. Salisbury & Co., Inc., of 105 South Wabash avenue, this city, was put to a sharp test one day recently when representatives of the Union Stockyards & Transfer Co. placed with them an order for 20,000 feet of rubber hose of a specified size to be ready for delivery within 24 hours, all cut into various designated lengths. The stockyards had been closed on account of the hoof and mouth disease among the cattle, and this hose was needed to comply with government orders, which were to disinfect every inch of the pens, including the fences, posts and pavements.

"There was a brief discussion," said Richard H. Geier, general manager of the company, "and we decided that by keeping the entire force on the job the greater part of the night we could fill the order in the time required. I say with pride that all of the boys and some of the girls in our establishment volunteered for the work with great enthusiasm, and an hour before the stated time we were ready with the hose, cut into the proper lengths. We felt that it was more or less of a patriotic matter to use our best efforts in assisting to stamp out this dread disease, which threatened for a time to seriously cripple the cattle industry in the West."

Most of the repair work in the grain elevators is over for the present and there is not the same amount of activity in the rubber belting lines that there was a few weeks ago. However, the strain placed upon some of the northwestern elevators in handling the great grain crop has resulted in more than the usual number of hurry orders for equipment.

Considerable discussion has been created among the mechanical rubber men of the city by an announcement that the price of narrow rubber belting containing cotton is soon to be increased. There is little doubt in the minds of the local dealers that the cost of a narrow belt is considerably more than half that of a belt twice as wide; the proportion is nearer two-thirds,

in the estimation of mechanical rubber men of this city. Therefore the change will meet with little protest from this quarter.

* * *

Rubber men here were enthusiastic on hearing early this week of the plan which had gone through at the trade meeting of representatives of commercial organizations held at Memphis, Tennessee, to establish branch banks in South American countries for the encouragement of commerce with the United States. This means that it will be possible for rubber manufacturing firms in this country to establish trade with dealers in the southern continent. The Chicago Association of Commerce was represented at the meeting in Memphis, and the rubber men of the city who belong to that enterprising body have taken a keen interest in the proceedings. Establishing banks is the first move in the campaign. It is believed that it will be possible, now that competition is less keen, owing to the war, to build up a satisfactory trade out of Chicago. The route will be by rail to New Orleans, and from that point by steamer down along the eastern coast or through the Panama Canal along the western seaboard. The cost will not be much greater than on shipments to points in California under the present rates on roads running west out of this city.

A. Romain, the sales manager of the Quaker City Rubber Co., which manufactures mechanical rubber goods, discussing the situation, said: "In a business like ours we must look at matters in a broad light, otherwise we cannot get the right perspective. I regard the establishment of the Federal Reserve Banking System as one of the most encouraging things that has happened to the rubber trade of this city in some time. The city has been made the center of one of the big reserve banks, and that is bound to attract and stimulate capital for all commercial enterprises to this point."

Manufacturers of pianos and piano player actions in this city have put up a cry of distress on account of a feared shortage in the particular grade of rubber tubing which they use in the manufacture of their product. They have been paying advanced prices without much complaint, and their fears were excited by a letter sent out by a prominent supply house stating that an unfavorable turn of affairs in the eastern theater of war might result in the complete depletion of the supply of rubber available for the manufacture of rubber tubing. The tubing used by the piano men must be of a certain fine quality; no other kind will do. In the manufacture of player actions large quantities are used, as it is necessary, on account of the bellows device, to have conduits which will conduct the compressed air to the points where sound is produced. Large manufacturers of player actions in this city are the Gulbransen-Dickinson Co., the Sonorus Piano Player Co., and the Schubert Piano Co., the last named concern also having an office in New York.

THE RUBBER TRADE IN TRENTON.

By Our Regular Correspondent.

AS a manufacturing center Trenton has come to be recognized as one of the most important of the cities of the east, and its lines of production are both varied and extensive. The manufacturers of the city are co-operating with the local Chamber of Commerce for an exhibit of Trenton products at the Panama-Pacific International Exposition, which opens in San Francisco, February 20 next, and this display will probably give further recognition to the city and its industries. There will be a "Trenton Day" at the exposition, extensively advertised. The space allotted to the Trenton section is close to the Court of Honor, in the Palace of Manufactures. Among the rubber companies that have so far contracted for space are the Home Rubber Co. and the Essex Rubber Co. The exhibits are now being prepared and collected at the Second Regiment Armory, where they will be on display from

December 7 to 15, immediately after which they will be shipped to San Francisco. The proceeds from admission to the San Francisco exhibit will be contributed to the National Red Cross fund for the relief of European war victims.

No work in this city of industries is being carried on more industriously at present than that of collecting funds and supplies for the relief of the Belgians. The ruthless invasion of this peaceable country and the wanton destruction of life and property, with the consequent hardships entailed on survivors, have aroused universal sympathy, which is being expressed in the practical form of donations to assist in relieving these sufferings. The Belgian relief work here is well organized. Committees have been appointed in every line of industry to solicit and receive contributions. Clothing has been collected by the women's committee, and two large boxes of warm clothes were forwarded to Liverpool in care of Ernest E. Buckleton, of the Northwestern Rubber Co. of that city, who visited Trenton a few weeks ago in the interest of Belgian relief. The rubber mills' committee consists of A. Boyd Cornell, Charles H. Stokes, Clifford H. Oakley and Cornell Murray; while Frank W. Thropp and F. W. Roebling are on the committee for iron mills, machine shops, etc.

The Braender Rubber & Tire Co., of Rutherford, New Jersey, has just put on the market a new non-skid tire. This new tread, as will be seen in the illustration, is of the combined raised and depressed type. It retains the fishtail cross bars of the original Braender "Bull Dog" non-skid, and has in addition six heavy webs of rubber so placed between these bars as to give more rubber on the tire, with more surface to take the wear. The addition of these webs overcomes the tendency to skid and in combination with the cross bars insures a continuous and smooth riding surface. The new "Bull Dog" will be exhibited at the January automobile shows in both New York and Chicago.



At the Inter-State Fair recently held in New Jersey the Essex Rubber Co. had an interesting exhibit of rubber heels and soles. One feature which attracted attention at this exhibit was a barrel full of rubber heels. Prizes were awarded for the nearest guess to the number of heels contained in the barrel. One visitor guessed the exact number, 1,896 heels, winning a first prize of \$5.

A permit has been granted the Globe Rubber Co., Trenton, for a new factory building 72 x 59 feet, two stories high.

A threat to blow up the plant of the American Rubber Co., of this city, recently made by Peter Flood, a former convict who had been refused work in the plant, was followed by the arrest and conviction of Flood, with a sentence of one year in the workhouse.

At the meeting of the Board of Managers of the Sons of the Revolution in the State of New Jersey, on November 12, Frederick F. Katzenbach, vice-president of Katzenbach & Bullock Co., Inc., manufacturers of chemicals for the rubber trade, was received to membership. Mr. Katzenbach traces

his ancestry back to Lieutenant Imlay, of Monmouth County, New Jersey.

The Board of Trade of New Brunswick, in a recent advertisement, calls attention to the lack of proper housing facilities for workmen in that city. The enlargement of the India Rubber Co.'s business has brought ten new families to the city, and difficulty is being experienced in securing proper accommodations for this increase in population.

The Rutherford Rubber Co., of Rutherford, New Jersey, has moved its New York branch from West Forty-second street up to the automobile district at Fifty-second street, being now located at 1668 Broadway. This company, which manufactures the Sterling Vacuum-Bar tire, sells direct to the user, maintaining factory sales branches in the principal eastern cities.

The factory building at Harrison, New Jersey, formerly occupied by the Greenfield Engine Co., has been leased by the Auto Tire & Tread Co. for manufacturing purposes.

SOME RECENT CUSTOMS RULINGS.

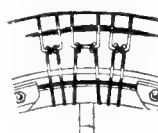
The Board of General Appraisers on November 4 affirmed the classification of the customs authorities on raincoats imported by M. L. Rothschild & Co., of St. Paul and Minneapolis, as cotton wearing apparel, under the old tariff. The importers claimed classification under manufactures of rubber, on which the rate is 35 per cent. ad valorem, but the evidence showing that while rubber predominated in weight of the garments cotton was of the greater value, the 50 per cent. rate was imposed.

A decision rendered on November 5, also affirming the original customs classification, places elastic braid composed of silk and rubber threads under the classification "braids, composed of yarns, threads or filaments," on which the rate is 60 per cent. ad valorem. The protest against this classification was made by Calhoun, Robbins & Co., New York, who contended that rubber was the component of chief value in the braids and that in its condition in the braids it was neither a yarn, thread nor filament, but this protest was overruled and the contention denied.

Brooches of hard rubber, returned by the Collector at 60 per cent. ad valorem, under the act of 1897, as jewelry, have been reappraised by the Board, which classifies them as manufactures of hard rubber, entitled to enter at 35 per cent.

A SMALL TOOL FOR MAKING A WIRE CLAMP.

There are a good many places where a wire clamp if made tight and enduring is exceedingly serviceable, as, for instance, in clamping a piece of hose or fixing a blowout, in holding together a wooden pail when the hoops have grown loose or been lost and for fastening a steel spring that has become broken. R. A. Beaudette & Co., of Chippewa Falls, Wisconsin, have recently put on the market a little tool called the Rab Wire



Clamper which makes it possible to put a wire clamp wherever it may be needed very quickly and easily. The wire is bent in the form of a loop and put around the article to be clamped, the free ends pulled through the loop, and then by the use of this small tool, which is quite inexpensive, the wire is drawn taut and bent over and clamped and cut. The accompanying illustrations show the use of wire clamps as fastened by this tool in repairing a tire and in clamping a piece of hose. Beckley Ralston, of Chicago, is the distributor.

News of the American Rubber Trade.

CHARLES T. WILSON CO., INCORPORATED.

ON November 1 the business of Charles T. Wilson, importer of and dealer in crude rubber at 46 Cortlandt street, New York, was transferred to the Charles T. Wilson Co., Incorporated, all unfilled contracts and obligations being assumed by the new concern. This company, of which Charles T. Wilson is president and Henry Perlsh vice-president, is incorporated under the laws of New York with an authorized capital stock of \$250,000, of which they state that \$210,000 has been issued and paid in.

THE T. H. & B. CHEMICAL CO.

Having sold his interest in the firm of Ernest Jacoby & Co., manufacturers of rubber substitutes, with factory at South Boston, Mr. Ernest Jacoby has resigned his position as an officer of that company. The business will be continued as heretofore, under the name of the T. H. & B. Chemical Co., with offices at Hyde Park, Massachusetts, and Mr. Jacoby will continue to sell its products.

THE RUBBER RECLAIMERS' ANNUAL MEETING.

The annual meeting of the Rubber Reclaimers' Club was held at the Hotel Vanderbilt, New York, on November 5. Francis H. Appleton was re-elected president, R. W. Seabury was re-elected treasurer, and Lloyd E. Appleton was elected secretary, succeeding J. Norman. The club is in a very healthy condition and its monthly meetings for the exchange of views on the reclaiming industry are largely attended.

ANNUAL REPORT OF THE BOSTON WOVEN HOSE & RUBBER CO.

The annual report of the Boston Woven Hose & Rubber Co. shows total assets on August 31 valued at \$3,710,036, or a value of \$171,700 in excess of assets on the same date last year; while the surplus shows a gain of \$177,869, standing at \$1,460,042 in the last report, against \$1,282,174 in 1913. The assets include cash and debts receivable to the amount of \$913,564, and the liabilities include accounts payable \$48,304, with a floating debt of \$348,000.

This company has declared a regular semi-annual preferred stock dividend and a regular quarterly common stock dividend of \$3 per share, payable December 15 to stockholders of record on December 5. It also declared an extra dividend of \$25 a share on common stock, payable November 27 to stock of record on November 23, offering to common shareholders the privilege of subscribing to 2,500 shares of new common at par, in the ratio of one share of new for each four shares held of the old issue.

A CHANCE TO VISIT SOUTH AMERICA.

The Travelers' Department of the Fidelity Trust Co. of Baltimore has chartered the steamship "Finland" for the purpose of taking a party of manufacturers, exporters, importers, and others on a tour, lasting 106 days, of the principal ports of South America. The ship will sail from New York January 27, and from Baltimore two days later; will visit all the important ports in the southern continent, and return home by way of the Panama Canal. This trip is promoted for the purpose of giving American business men a chance to acquaint themselves with the business opportunities in South America.

WELLINGTON, SEARS & CO. SECURE GOVERNMENT ORDERS.

Government orders for about a million yards of cotton duck have recently been received by Wellington, Sears & Co., of Boston—manufacturers and exporters of ducks, sheetings, drills, etc., especially suited to the needs of the rubber trade—from the European countries now involved in war. The French government alone has ordered, through the company's agency in Great Britain, half a million yards, presumably for army purposes.

RAW MATERIAL AND THE EUROPEAN WAR.

The terrible struggle now going on in Europe, and the consequent disruption of general commercial and manufacturing conditions, has brought in its train a lesson now receiving the serious consideration of most American manufacturers—that of the danger of dependence on supplies from over sea. The attention of manufacturing trades—including rubber—is of necessity turned to the availability and extent of domestic sources of supply of a dependable and reliable character. The recent mining of the waters around the British Isles creates a situation which is likely, among other things, to have a restrictive influence on the importation of chalk, on which the manufacture of whiting is dependent, and is already affecting the market for deliveries over next year.

The Industrial Chemical Co., of 200 Fifth avenue, New York City, which for many years has been studying the requirements of the rubber manufacturing industry, has now perfected its special brand of "Alba Whiting" to such a degree as to make it a most efficient compounding material in the manufacture of rubber goods. The largely increased demand from the trade has fully justified the company's policy of expansion in erecting a thoroughly up-to-date plant under scientific management, providing a means of doubling the present output and so placing the company in a position to guarantee regularity of supplies, in anticipation of an additional demand for material entirely of American origin. Alba Whiting has been on the market for over ten years, but its use has greatly increased during the last three years. There are now over 80 rubber manufacturers who are using this ingredient in their compounding.

THE FISK RUBBER CO. MAKES A RED TOP TIRE FOR FORD CARS.

The Fisk Rubber Co., of Chicopee Falls, Massachusetts, is making a non-skid tire with red top and white side walls for use on Ford cars. This tire is made only in sizes 3 x 30 inches and 3½ x 30 inches. The tread has additional thickness and is claimed to ride as smoothly as a plain tread and without any bump and vibration. A letter received November 13 by the Fisk company from one of its representatives in Arizona states that he had just examined a set of red tops on a Ford car used in automobile stage service through the desert that had traveled approximately 6,000 miles and looked good for fully as many miles more.

MONATIQUOT RUBBER WORKS CO. APPOINTS NEW AKRON AGENT.

The Monatiquot Rubber Works Co., from its Boston sales office at 176 Federal street, announces that James C. Baldwin, of Akron, Ohio, has been appointed agent in that state for "Naturized" Rubber, the product of the Monatiquot plant at South Braintree, Massachusetts. The company has heretofore been represented in that section by L. Y. Croft.

RUBBER COMPANY DIVIDENDS.

The Goodyear Tire & Rubber Co., of Akron, at a quarterly meeting held Monday, November 2, declared an annual dividend of 12 per cent. on the \$8,000,000 common stock of the company.

The Swinehart Tire & Rubber Co., of Akron, has declared a regular quarterly dividend of 1½ per cent., payable Jan. 15 to stock of record Dec. 15.

The B. F. Goodrich Co., of Akron, has declared a regular quarterly dividend of 1¾ per cent. on its preferred stock, payable January 1 to stockholders of record on December 21.

CAPITALIZATION CHANGES.

The Star Rubber Co., of Akron, Ohio, has increased its capital stock from \$100,000 to \$200,000.

The Excel Rubber Co., of Akron, Ohio, has increased its capital stock from \$10,000 to \$30,000.

SUIT AGAINST INDIANA RUBBER & INSULATED WIRE CO. DROPPED.

The suit brought against the Indiana Rubber & Insulated Wire Co., of Marion, Indiana, by the Buffalo Specialty Co., of Buffalo, New York, to enjoin the former company against alleged infringement of rights in a tire fluid, has been dismissed in the United States District Court at Indianapolis. The patent for this fluid was purchased by the Indiana concern from the inventor, and in turn sold to the plaintiffs in this action, whose complaint charged that after the sale the defendants had made fluid as covered by the patent.

MORE COMPANIES TAKE SPACE FOR JANUARY AUTOMOBILE SHOWS.

On page 82 of the November number of THE INDIA RUBBER WORLD mention was made of space having been allotted to a number of companies engaged in rubber and allied manufactures in the automobile shows to be held at New York and Chicago January 2-9 and 21-30. Several other companies have since been allotted space. These include: The Cutler-Hammer Clutch Co., Milwaukee; The Dreadnaught Tire & Rubber Co., Baltimore; the Globe Rubber Tire Manufacturing Co., Trenton; the Standard Woven Fabric Co., Framingham, Massachusetts, and the Newmastic Co., New York.

The following concerns have taken space for the New York show only: Essex Rubber Co., Trenton; Rutherford Rubber Co., Rutherford, New Jersey; the Marathon Tire Sales Co., New York—a branch of the Marathon Tire & Rubber Co., of Cuyahoga Falls, Ohio; the Steel Pneumatic Tube & Tire Co., New York; the O'Bannon Corporation, Providence, Rhode Island, and the Ashley Wire Wheel & Rim Co., New York.

DECISION AND AWARD IN WEED TIRE CHAIN SUIT.

A perpetual injunction has been issued by Judge Tuttle in the United States District Court at Detroit in the suit brought by the Weed Chain Tire Grip Co., the Parsons Non-Skid Co., Limited, and Henry D. Weed, restraining the Perry Chain & Grip Co., the Union Steel Screen Co. and the Motor Specialty Co. from the manufacture of tire chains which infringe patent No. 723,299 issued to Henry Parsons March 24, 1903. The plaintiffs in the case were awarded \$18,000, to cover costs of the suit and the profits which the defendants had made from sale of devices infringing this patent.

IMPORTING FIRM ASSIGNS FOR BENEFIT OF CREDITORS.

Fred'k Probst & Co. (Adolph Victor), trading and commission merchants, of 82 Beaver street, New York, made an assignment on November 11 for the benefit of creditors, with liabilities approximating \$1,000,000. This business was established in 1845, by Probst & Memeristaza, who were later succeeded by Fred'k Probst & Co., Mr. Victor obtaining ownership in 1897. Included in the assigned estate are property rights in a large block of timber land in the State of Campeche, Mexico; right, title and interest in a plantation in the State of Chiapas, Mexico, and a plantation in the City of Coban, Guatemala, also a mortgage on property in the city of Vera Cruz. This assignment is said to have been caused by the encumbrance of \$200,000 of the firm's funds by the general manager and cashier, William F. Bostelman, who committed suicide on November 21.

THE SOUTHERN TIRE & RUBBER CO. TO MAKE TIRES.

Another new concern about to enter the field of rubber manufacture is the Southern Tire & Rubber Co., of Augusta, Georgia, which expects to be ready to start work by about the middle of December. This company, which is capitalized at \$75,000, has a new brick plant at Augusta, in the vicinity of the Armour fertilizer works. This plant—the main portion of which is 52 x 230 feet in area, and which has an addition 30 x 60 feet—with its equipment, is said to represent an outlay of approximately \$70,000. This equipment has already been installed. The company purposes manufacturing automobile tires, employing from 12 to 15 workmen at the start, with a capacity of about 50 tires a day.

TRADE NEWS NOTES.

The Cutler-Hammer Clutch Co., of Milwaukee, Wisconsin, well known in most of the large American rubber factories as the manufacturer of the Cutler-Hammer Magnetic Clutch and Brake, has removed its Cincinnati office from the Fourth National Bank Building, taking larger quarters in the Gwynne Building.

A visit of inspection was recently made by representatives of the East Palestine Rubber Co. to the plant at Clyde, Ohio, formerly occupied by the General Motors Co., its suitability as a supplementary tire factory to the company's plant at East Palestine, Ohio, being under consideration.

The Superior Tubes & Accessories, Limited, has been incorporated at Toronto, Ontario, with a capital stock of \$300,000, to manufacture automobile equipment, etc. The incorporators are W. A. J. Case, J. B. Taylor and C. G. Lynch, and the principal office of the company is at Toronto, 1201-5 C. P. R. Building.

By arrangements recently effected, the H. W. Johns-Manville Co., of New York, has taken the exclusive distributing agency for "Tirenew" and "Narco," products of the National Rubber Co., of St. Louis, Missouri. These products, which are rubber compositions intended respectively for coating tires and for tire filler, will hereafter be known as J-M Tirenew and J-M Narco.

According to an announcement made by the Business Men's Association of Findlay, Ohio, the newly formed Toledo-Ford Tire Co. will locate in that city, manufacturing a line of tires exclusively for Ford cars, to be sold direct to the users. The company states that it expects to be able to sell at 25 per cent. below usual price.

The Pneumatic Hub-Tire-Wheel Co. has been incorporated under the laws of Delaware, with a capital stock of \$5,000,000, by L. C. Evans, G. J. Lampton and N. W. Rowland—all of Louisville, Kentucky—with the purpose of erecting a factory as soon as satisfactory arrangements can be effected.

A demand has been made upon George D. Porter, Philadelphia's Director of Public Safety, by a committee appointed by the Rotary Club of that city, for an immediate test of the fire hose in use there. In spite of assurances of Councils that the hose is all right, repeated charges have been made that the city's fire hose is in bad condition and liable to burst at any time, and the manufacturers consider it their right and a matter of importance to themselves to know that this public equipment is in first class shape.

Judge Dodge of the United States District Court of Massachusetts recently denied the petition of the Harris Raincoat Co., of Boston, for the sale of the assets of the Oxford Rubber Co., of Cambridge, Massachusetts, the receiver of the Oxford company assuring the court that he would soon present a similar petition.

The plant of the Fisk Rubber Co., at Chicopee Falls, Massachusetts, which was closed during the first week of November for annual inventory, reopened on the 9th.

The Williams Tire & Rubber Co., which recently acquired property at Vista, near McKeesport, Pennsylvania, on which to erect a plant for the manufacture of tires and other rubber goods, expects to have ready for operation by Spring a factory which will require the services of 500 workmen. Work on this new plant is very soon to begin. A. D. Williams, president of the company, of Glassport, Pennsylvania, is quoted as stating that \$60,000 of the new \$255,000 stock issue of the company—formed last September—has already been subscribed for.

A convention of the sales force of the Standard Woven Fabric Co. was recently held at the company's factory at Framingham, Massachusetts. A convention address by the general manager, Mr. Burdick, discloses a very satisfactory business for the past year, the sales of "Multibestos" brake lining during that time having doubled.

NEW INCORPORATIONS.

Atlantic Rubber Co., October 22, 1914; under the laws of Delaware; authorized capital, \$250,000. Incorporators, E. C. Boyd, Norman P. Crouch and Horace J. Joslyn—all of Wilmington, Delaware. To manufacture and deal in the products and by-products of rubber.

Brazilian Rubber & Manufacturing Co., October 30, 1914; under the laws of Illinois; authorized capital, \$5,000. Incorporators, Edward Graff, Simon La Grou and William E. Rafferty. Principal place of business, 105 West Monroe street, Chicago, Illinois. To buy and sell at wholesale and retail, rubber clothing and general merchandise.

Cut-Rate Tire Co., The, October 1, 1914; under the laws of Tennessee; authorized capital, \$3,000. Incorporators, P. J. Quigley, A. N. Sullivan, R. J. Quigley, J. G. Weatherford and V. G. Peace. To buy, sell, exchange, repair and otherwise engage in the automobile tire business.

Hood Tire Co., November 3, 1914; under the laws of Massachusetts; authorized capital, \$20,000. Incorporators, Charles W. Dailey, Jr., Robert Muir, Herbert E. Rose, Herbert C. Mason and Edward I. Aldrich—all of Watertown, Massachusetts. To deal in tires, rims and wheel equipment for motor or other vehicles.

Humphrey-Kennard Co., The, October 19, 1914; under the laws of Ohio; authorized capital, \$10,000 divided into 100 shares of \$100 each. Incorporators, J. R. Humphrey, Floyd E. Waite, Chas. A. Colvin, E. G. Hoag and L. M. Sewell. To buy, sell and deal in rubber tires, etc.

Lyon Tire & Rubber Co., October 15, 1914; under the laws of Illinois; authorized capital, \$10,000. Incorporators, A. W. Lemke, LeRoy Harriss and W. B. Lathrop. To manufacture, buy, sell and exchange automobile tires, tubes and other automobile accessories.

Mattson Rubber Co., November 12, 1914; under the laws of New Jersey; authorized capital, \$200,000. Incorporators, John Behrens and John Henry Behrens—both of Hasbrouck Heights, New Jersey—and Henry Lemmermann, Bronxville, New York. To acquire, sell, trade, deal in and with rubbers and rubber goods of all kinds, including automobile tires, inner tubes, etc.

Mohawk Supply Co., The; September 30, 1914; under the laws of Ohio; authorized capital, \$2,500 divided into two hundred and fifty shares of \$10 each. Incorporators, F. F. McGinness, William Hartman, C. P. Bidinger, F. J. Rockwell and G. B. Owens. The principal place of business is Akron, Ohio. Jobbers and retailers of rubber goods and supplies.

Needham Tire Co., October 22, 1914; under the laws of Massachusetts; authorized capital, \$350,000. Incorporators, John S. Patterson, Cambridge; James M. Patterson, Winchester; William H. Burgess, Howard W. Lang and W. Louis Williams—of 50 State street, Boston—all in Massachusetts. To manufacture and sell automobile tires and inner tubes.

Non-Pneumatic Suspension Tire Co., The; October 14, 1914; under the laws of Ohio; authorized capital \$10,000, divided into 100 shares of \$100 each. Incorporators, Anthony Schemel, George Wehrfritz, F. H. Goosmann, C. W. Mackenbach and H. Serkowich. Principal place of business Cincinnati, Ohio. To manufacture automobile tires, rims and accessories.

Penn Rubber Traffic Co., November 9, 1914; under the laws of Delaware; authorized capital, \$150,000. Incorporators, William Boyd, W. I. N. Lofland and W. F. P. Lofland—all of Dover, Delaware. To manufacture and deal in automobile tires and inner tubes, rubber sundries, etc.

Penn Square Tire Reclaiming Co., The; October 23, 1914; under the laws of Ohio; authorized capital, \$10,000 divided into 100 shares of \$100 each. Incorporators, L. H. Heller, Otto A. Erb, Jos. F. Krajewski, I. Graner and Nathan Herstam. To manufacture, buy and sell, at wholesale and retail, automobiles, automobile accessories and supplies.

Pneumatic Hub-Tire-Wheel Co., October 22, 1914; under the

laws of Delaware; authorized capital, \$500,000. Incorporators, G. J. Lampton, N. M. Rowland and L. C. Evans—all of Louisville, Kentucky. To erect manufactories and workshops for the manufacture of automobile wheels and tires.

Safety Signal Co., Inc., October 27, 1914; under the laws of New York; authorized capital, \$200,000. Incorporators, Arthur W. Dennen and Stanley C. Fowler—of 19 Cedar street—and Rebecca Hilliker, 80 Maiden Lane—all in New York City. To manufacture devices for automobiles, rubber goods, etc.

Safety Tread Co., Inc., The; November 13, 1914; under the laws of New York; authorized capital, \$20,000. Incorporators, Paul P. Crosbie, 29 Broadway, James A. Edwards, 32 Liberty street—both of New York City—and Raymond E. Hartley, Mountain View, New Jersey. To manufacture rubber stair treads, etc.

Sponge Rubber Inner Heel Co., October 23, 1914; under the laws of New Jersey; authorized capital, \$25,000. Incorporators, Albert Ensor, Sr. (president and treasurer), and William J. Broidy—both of Paterson—and W. Beebe Price (vice-president), West Nutley all in New Jersey. To manufacture and sell detachable ventilators for boots, and the like, and to purchase and deal in all materials necessary for their manufacture.

Standard Tire & Rubber Co., November 10, 1914; under the laws of Delaware; authorized capital \$250,000. Incorporators: F. R. Hansell, Philadelphia, Pennsylvania; George H. B. Martin and S. C. Seymour, of Camden, New Jersey. To buy, sell and manufacture all articles necessary to, or used in the management, running and operating of automobiles.

Tator Co., Inc., Arthur R., October 28, 1914; under the laws of New York; authorized capital, \$1,000. Incorporators: Arthur R. Tator, 1051 Prospect Place; Hugh F. Foster, 617 McDonough street, and John F. Undutsch, 1051 Halsey street—all in Brooklyn, New York. To deal in autos, tires, etc.

Traver Puncture Proof Tire Co., Inc., November 9, 1914; under the laws of New York; authorized capital, \$400,000. Incorporators, Gustave Koenig and Lena Koenig—both of 10 Mott avenue—and Philip C. Traver, 6 Pearl street—all in Far Rockaway, New York. To manufacture tires, etc.

United Supply Stores, Inc., November 6, 1914; under the laws of New York; authorized capital, \$5,000. Incorporators: Arthur S. Stein, 197 Palisade avenue, Jersey City, New Jersey; Louis G. Duquet, 107 West Thirty-sixth street, and Arthur W. Chatfield, 312 West Fifty-second street, New York City. To deal in tires, rubber goods, auto accessories, etc.

TRADE NEWS NOTES.

On December 1 the Rubber Trading Co. moved its office in New York City from 38 Murray street to 9-15 Murray street.

Contracts have been let for an addition to the factory of the Farrel Foundry & Machine Co. at Ansonia, Connecticut.

The Kansas "Pure Shoe" law, which was passed by the legislature in 1913, to become operative on April 1 last, has been declared constitutional by Judge A. W. Dana of the District Court at Topeka in that state. A suit to test the legality of this act was brought on petition of the Payne Shoe Co. of Topeka, in behalf of about 450 shoe retailers who are members of the Kansas Retail Shoe Dealers' Association.

A Customs House report on merchandise in bonded warehouse on the first of November contains the following details regarding chicle: Value in bonded warehouses within the District of New York, November 1, 1914, 266,115 pounds, valued at \$94,257, against 105,328 pounds, with a value of \$33,358 on November 1, 1913. The quantity in bond on October 1 was valued at \$103,629.

A. G. Spalding & Brothers, sporting goods manufacturers, have commenced work on an addition to their factory at Chicopee Falls, Massachusetts. The promotion of this work was delayed owing to the war, but present demands have shown the necessity for immediate increase of capacity.

WILMER DUNBAR.

MR. DUNBAR is not so very old—in fact he is only a few weeks beyond the forty-five-year mark—but he has had a variety of experience in the rubber industry which few men would secure even if they lived to the ripe age of Methuselah. If there is any doubt upon this point the details given below will dissipate it.

Mr. Dunbar was born in Johnsonville, Pennsylvania, in 1869 and while still a boy picked up a good deal of information regarding the pottery industry, then quite flourishing in that town. When he was fifteen he went to Trenton, New Jersey, hoping to get work in a pottery factory, but as he found no work of that character he looked about and soon got a position with the Star Rubber Co. The general manager took an unusual interest in the industrious country boy and assigned him to work in practically every department of the factory, so that at the very start of his rubber career he secured a wide range of information. When, in 1886, the Knights of Labor started a strike against this company, young Dunbar was one of the few who remained loyal. He stayed with this company for six years, leaving it in 1892 to go with the newly organized Eastern Rubber Manufacturing Co., now known as the Hamilton Rubber Manufacturing Co.

Here he remained until 1896, when he cast in his lot with the Diamond Rubber Co., then a \$50,000 corporation. He was made superintendent of its mechanical department. In the following year he installed a rubber department for The Whitman & Barnes Manufacturing Co. and became its first general superintendent. Two years later he was one of three men who organized the Alden Rubber Co., becoming its vice-president and general manager. After five years in this position he joined the Pennsylvania Rubber Co., as factory manager and general superintendent, and while in this position organized and equipped the Westmoreland Rubber Manufacturing Co. and, as its general manager, operated it very successfully in the production of reclaimed rubber. In 1909 he left these two companies and during the next three years was a general consulting expert and in that capacity built several reclaiming plants.

Early in 1912 he joined the McGraw Tire & Rubber Co. for the purpose of doing certain reorganization work, and having accomplished his purpose he retired after a few months and became identified with the East Palestine Rubber Co., of East Palestine, Ohio. While retaining his connection with this company, he organized, in February, 1913, the Greensburg Tire & Rubber Co. for the manufacture of inner tubes at Greensburg, Pennsylvania; and still later he became identified with the Dreadnaught Tire & Rubber Co., of Baltimore, Maryland, building and equipping its plant for the manufacture of automobile tires. He is at present associated with the three companies last named, being president of the East Palestine company, vice-president and general manager of the Greensburg company and also vice-president and general manager of the Dreadnaught company.

Notwithstanding all his wide experience in the manufacture and sale of rubber goods and the financing of rubber industries,

Mr. Dunbar's chief pride is in his ability as a rubber compounder.

Incidentally it might be mentioned that amid all these varied activities Mr. Dunbar found time, in May, 1890, to get married—to Miss Florence M. Peters, of Trenton. Evidently three is his favorite number, for he not only has the management of three different rubber companies, but he is the father of three boys and three girls.

PERSONAL MENTION.

Harvey S. Firestone, president and general manager of the Firestone Tire & Rubber Co., of Akron, recently subscribed for \$20,000 worth of second mortgage bonds of the Detroit Athletic Club. This organization, which has built a fine new club house, put \$60,000 worth of mortgage bonds on the market, \$40,000 of which were purchased by members and others interested in its success.

Frank Venn, the well known manufacturer of rubber footwear marking devices, has recently returned from a tour of Europe, where he was extremely successful in placing his machines. Mr. Venn also manufactures a marking ink in a variety of shades which he is sending to all parts of the world.

H. E. Taylor has been placed in charge of the branch which the Gibney Tire & Rubber Co., of Conshohocken, Pennsylvania, has opened at 1712 Michigan avenue, Chicago.

The United States Tire Co. has appointed Thomas Wilkinson manager of its Los Angeles branch. He is well acquainted with the trade of Los Angeles, having been associated in that city with the Hartford Rubber Works Co., before becoming manager of the San Francisco branch of the United States Tire Co.

Mr. Jesse Hawkins, who has been connected with the New York office of the United States Rubber Co. for a number of years, has just been appointed general manager of the Standard Rubber Shoe Co., of Chicago, succeeding Mr. Burt in that

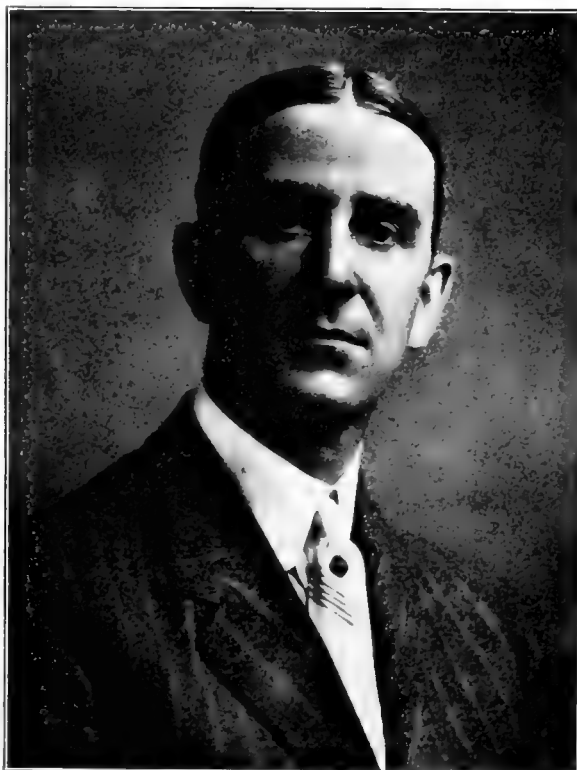
position. Mr. Hawkins starts on his new duties December 1.

C. W. Heintz, who, on the resignation of B. F. Morris, was appointed manager of the Buffalo branch of the Republic Rubber Co., of Youngstown, Ohio, has been for the past five years connected with the company's sales office in New York.

R. W. White has been succeeded in the management of the Columbus, Ohio, branch of the Goodyear Tire & Rubber Co. by W. W. Magill, Mr. White having been promoted to the Chicago branch management.

L. M. Bourne has been appointed manager of the factory of the Double Fabric Tire Co., at Auburn, Indiana. Mr. Bourne was for six years associated with the Goodyear Tire & Rubber Co., as assistant production manager and in charge of the laboratories of the experimental department.

Charles L. Benjamin, advertising manager of the Cutler-Hammer Clutch Co., of Milwaukee, Wisconsin, was the guest of honor and principal speaker at a meeting on October 7 of the Advertisers' Club of Milwaukee. His subject was "Business Building Through the Business Press."



WILMER DUNBAR.

The India Rubber Trade in Great Britain.

By Our Regular Correspondent.

CAPTURE OF GERMAN TRADE.

THIS subject I note is attracting considerable attention in America as well as in England, and it is obvious that the two countries are engaged in serious, albeit friendly, rivalry. As THE INDIA RUBBER WORLD is quite open as to America's aims and aspirations there is no reason why I should not be equally frank in referring in a general way to what is being done or aimed at on this side. One principal difficulty seems to lie in the objection to imitating German methods, with regard to which situation we have been brought to task time after time by our consular service. I refer more particularly to the employment of travelers speaking foreign languages, the issue of price lists in the language and currency of the foreign countries, the supply of cheap qualities where better goods are not desired and better credit accommodation. Whether the business is worth having when these points are considered is a matter on which much doubt exists in the minds of individual manufacturers, and it is they who have to decide, as, although the Board of Trade is very active at present in its Intelligence Department, this activity extends no further than the obtaining and passing on of information.

One of the latest bulletins issued by the board relates to the export trade of Germany and Austria-Hungary in rubber goods in neutral markets. This shows that the maximum amount of trade which might be diverted to British manufacturers from their German and Austrian rivals amounts to £870,000 (\$4,350,000) in the United Kingdom market and £2,819,600 (\$14,098,000) in Colonial and neutral markets. These figures, I must add, do not include machinery belting, toys and tires for motor cars, motorcycles and bicycles. It is said that 75 per cent. of the solid bus tires used in London are of German make, showing what an important opportunity exists for the expansion of British trade. It would be interesting to know what is the state of affairs in the large German towns with regard to British tires—probably it is much more in favor of the home country.

On a previous occasion I referred to steam jointing material such as Klingerite as a material which had been largely imported from Austria and Germany. Special efforts are now being put forth to make this in England. The difficulty, however, is the general lack of knowledge of the details of manufacture. I have seen two or three advertisements lately for foremen who know the details required, but I don't suppose it will prove easy to get them. Even if such advertisements penetrated to the Continent and caught the eye of some workman not "called up" the odds are that if he managed to land in England he would speedily find himself in an alien enemy detention camp. It seems difficult for the general business man to understand that the knowledge of how to make this, that or the other is not universal nor is it often to be acquired from text books. Many people seem to think that, given capital and better banking facilities, we can forthwith if we choose make for ourselves almost everything in manufactures that have hitherto been imported. They overlook the fact that many goods are made behind closed doors and that the details of manufacture are by no means common property. I don't know the exact position of the American works with regard to this article, but, of course, they have long been to the fore in steam packing material made otherwise than with sheet asbestos as a base.

With regard to the rubber toy branch, I have not heard of any active steps being taken by our rubber manufacturers, and it is noteworthy that the Hammond Toy Manufacturing Co., Limited, brought out in London in October, announces that at present it does not propose to make rubber toys.

THE WAR AND RECLAIMED RUBBER.

The fact that reclaimed rubber and scrap have been lumped with raw rubber on the conditional contraband list has naturally been a blow to reclaimers, as a good deal of business is usually done with Germany. Strong representations have been made to the customs and excise authorities with a view to the obtaining of licenses where the buyer in a neutral country guarantees that the reclaimed will not leave his works. The matter has been before the Privy Council, but the decision is adverse to the reclaimers. I know of a case where a consignment of scrap, or so-called scrap, to Rotterdam has led to the detention of the ship at a British port other than that she sailed from, and at the time of writing the situation is somewhat acute.

It does not seem to be generally known that there are several and by no means unimportant rubber factories in the Scandinavian countries, and there is nothing necessarily suspicious, therefore, about shipment of raw rubber and reclaimed to, say, Christiania, not many miles from which capital are situated the Norske Galoge Fabrik of Mjøndalen, near Drammen. It might be thought that reclaimers could make up their export losses by increased home business owing to large government contracts being given out; but here they are hit again, and badly, because the government specifications all put an embargo upon the use of reclaimed rubber. These are the old established specifications, and it is officially announced that they must be strictly adhered to even in this time of rush and stress. Moreover, with the present price of raw rubber there is little inducement for manufacturers to turn to reclaims of the higher sort, if they were disposed to take the risk of disregarding the regulations; and common qualities would almost certainly be detected. Other business where reclaimed rubber is often largely used is very quiet, both because of the loss of export trade and also on account of the depressed state of the cotton industry. The fact that recent specifications for insulated wire in Germany forbid the use of reclaimed rubber has also been announced.

SOME RECENT PATENTS.

In the October issue of THE INDIA RUBBER WORLD an interesting detailed notice is given of French patent No. 460,273 for reclaiming fabric impregnated with rubber. The subject is one which has received a good deal of attention in the past in England at the hands both of scrap dealers and reclaimers, more particularly with regard to waterproof fabric cuttings. No business success, however, can be recorded, and the destruction of the fabric is the universal procedure of reclaimers. One of the difficulties has been the labor involved in sorting the woolen from the cotton fabrics, as in the case of scrap the recovered cotton is valueless while wool scrap can always find a sale in the district of Yorkshire associated with the "shoddy" industry. The dealers, however, stipulate that the recovered fabric must be absolutely free from rubber, and though this appears to have been successfully achieved, the difficulty of obtaining sorted woolen scrap at a reasonable price led to the abandonment of the proposed enterprise. I notice that the French patent has special reference to the reclaiming of fabric such as vulcanizing cloths which contain but very little rubber. The rationale of the process is to soften and loosen the rubber by immersing the fabric for two or three days in xylol. With regard to the use of this solvent, the article mentioned above states that its price is over a dollar a gallon and that it is now unobtainable. This, however, is not the case in England, where tar distillation is carried on on such a large scale. Leaving pure xylol out of account, it may be said that for any rubber solvent purposes or-

dinary solvent naphtha—which consists mainly of xylol—will answer the purpose. The price of this varies from, say, 10d. (20.27 cents) to 1s. 4d. (32.43 cents) per gallon, its increased use for motor cars instead of petrol being offset by a large production from recovery coke-ovens.

NOTES AND MEMORANDA.

Now that the fortnightly rubber auctions in London have ceased, manufacturers are buying by private treaty from the rubber brokers. This system is preferred by the plantation interests in the Far East as they are freed from the necessity of arranging freight to England, this being seen to by the brokers who buy outright in the East. As to whether the new procedure will become permanent or exist for the period of hostilities only is a matter on which divergence of opinion is expressed.

GOVERNMENT PROOFING ORDERS.

The Manchester district—which may be called the headquarters of the trade—is busily employed, and some difficulty is being found in obtaining sufficient hands. Surprise has been expressed at some large orders—one worth £40,000—going past Manchester to Scotland, and it is evidence that the Scotch firms have made close bids for the business, one especially successful firm being that of Campbell Achnach & Co., of Glasgow.

TO WHAT BASE USES.

A detachment of Royal Engineers has been busily engaged at the Handforth works—which should have been turning out Pavea rubber by the ton at this date. A rumor gained currency that the stoppage of the works was due to inability to obtain certain chemicals from Germany. However that may be, 5,000 or more German prisoners of war are shortly due there, and the erstwhile neglected buildings have thus come into prominence and print for the second time this fateful year.

CHANGE OF NAME.

Changes of Teutonic to British names have been numerous since the war began, though there have not been many instances in the rubber trade. One such which may be mentioned is that of the managing director of the Premier Waterproof and Rubber Co., Limited, of Manchester (no connection with the Premier Reforming Co., of melancholy memory), Mr. Hugo William Hassberger being now known as Mr. Hugo William Hatton, which name should always be used in correspondence.

ANOTHER GIFT OF RUBBER FLOORING.

On October 16 the rubber flooring presented by the Rubber Growers' Association to the Children's Hospital, Great Ormond street, London, was "opened" or inaugurated by Lady Jellicoe on behalf of the association whose president, Mr. John McEwan, made an interesting speech. The flooring which is of pleasing design was the work of the India Rubber, Gutta Percha & Telegraph Works Co., of Silvertown, London, and was made, it need hardly be said, of plantation rubber.

THE LATE JOSEPH FRASER.

The late Joseph Fraser's death in Scotland recalled the fact that he was one of the leading Ceylon planters, being regarded as one of the most practical authorities on tropical products. He was frequently consulted by plantation companies.

Mr. Fraser was one of the most scientific of planters, having worked his way to the top without the influence of friends, the feeling being that no one had better deserved his success. He was a director of the Grand Central Estates and other Ceylon companies.

Death has been busy among the Ceylon planters in 1914. Besides Mr. Fraser, the obituary roll includes Melville White and John Pettu.

ADDRESS TO SIR HENRY BLAKE.

An address has been presented to Sir Henry Blake by the Rubber Growers' Association, recalling his services as president of the London International Rubber Exhibitions of 1908, 1911 and 1914, as well as in the capacity of president of the London Committee of the New York Rubber Exhibition of 1912. His endeavors to make known the details of tropical agriculture are likewise referred to with appreciation, while his services thus indicated are mentioned as the continuation of his work as governor in five great colonies.

EXPORTS OF RUBBER MANUFACTURES FROM MANCHESTER TO THE UNITED STATES.

A report from the American Consulate at Manchester, England, contains a table showing the exports from that district to the United States, including the Philippines, during the months of October, 1913 and 1914. From this table the following figures relating to rubber are obtained:

	1913.	1914.
Balata and other belting.....	\$796.53	\$28.30
Elastic web, cord, etc.....	382.31	50.22
India rubber sheets, pouches, etc.	1,219.50	3,298.69
Waterproof garments and cloth.	5,793.28	5,810.71

RUBBER COURSES AT THE MANCHESTER SCHOOL OF TECHNOLOGY.

Under the auspices of the Manchester education committee two laboratories were installed some years ago at the Manchester School of Technology, one for analytical work and the other for experiments in rubber manufacturing and for industrial investigations. The equipment includes a mixing mill and three-roll calender, a jacketed vulcanizing pan and a double platen, steam-heated vulcanizing press.

A course of 20 lectures on the production of rubber and the manufacture of rubber goods is scheduled for this season's course, which opened September 22.

RUBBER INSTRUCTION IN LONDON COLLEGES.

Two important rubber courses are in progress in London this fall and winter. One is a series of 12 lectures at the City of London College by Mr. Fred. Kaye on a group of subjects connected with rubber, including its commercial classification, plantation rubber, vulcanization, waterproofing and the manufacture of soft and hard rubber goods.

Last session of the rubber course at the Northern Polytechnic Institute, Holloway N., was attended by 38 students who competed for the prizes given, aggregating £15. For the coming session prizes amounting to £25 have been donated by Mr. Noel Trotter and Mr. Arthur Lampard.

GOLD MEDAL FROM THE RUBBER GROWERS' ASSOCIATION.

Mr. H. N. Ridley, C. M. G., late Director of Gardens and Forests, Straits Settlements, has received an honorary gold medal from the Rubber Growers' Association, London.

DEATH OF A PROMINENT RUBBER DIRECTOR.

After three months' illness Mr. Keith Fraser Arbuthnot died recently at Billingham, Sussex, England. He was one of the most prominent figures in the rubber share world. He was born in 1864. After being educated at Rugby he became a Mincing Lane tea broker, and was later on largely interested in rubber plantation companies, of many of which he became a director. In 1910 the Rubber Share Trust & Finance Co. then organized with a capital of £350,000, took over a number of his holdings. He was recently chairman of the Anglo-French Mercantile & Finance Corporation and of the United Sumatra Rubber Estates, Limited.

Trans-Atlantic Notes.

[*Situation in Plantation Rubber; the War's Rubber Requirements; Views on Overproduction*]

SINCE the war broke out the London rubber market has, if anything, undergone a change for the better, so far as the plantation article is concerned. At the end of July smoked sheet was quoted at 2s. 2½d. [53.7 cents] per pound; at the time of writing it stands at 2s. 5½d. [59.8 cents]. On the other hand, fine hard Pará has fallen from 2s. 10¾d. [70.4 cents] to 2s. 6½d. [61.8 cents]. Latterly a fairly substantial rise has taken place in the price of plantation rubber, due mainly to the sinking of the steamer "Troilus," with some 1,200 tons of rubber aboard, by the German cruiser "Emden," since destroyed.

As regards the actual consumption of rubber, at the present time one can only point to the firmness of prices and infer that the demand is keeping fully abreast of the supply. This is the more remarkable because, for the time being, the Continental demand is almost a dead letter. The Antwerp market was, of course, suspended long since and the business transferred to London. Importers have thus to depend almost entirely upon the British and American demand, and so far, this has been sufficient to preserve the balance. Many English manufacturers are now busy with Government contracts of a size hitherto unheard of, and it is expected that this activity will be maintained as long as the war lasts. Much trade also is being secured that would, in the ordinary course of events, have gone to Germany and Austro-Hungary; and there seems no reason to doubt that this trade will be retained here after the war. All this notwithstanding, it is an open question whether the special requirements of the armies in the field will counterbalance the falling off in other directions. So far, market evidence gives answer in the affirmative.

POSSIBILITY OF SURPLUS.

The question of providing against a surplus of plantation rubber has been revived and the proposal is made that producers should set aside a percentage of their crops to subsidise rubber roadways and the development of new uses for the product in general. The fear is certainly entertained in some quarters that unless some such scheme be adopted a big surplus of rubber may accumulate within the ensuing twelve months.

The general situation in rubber was ably reviewed the other day by Mr. A. A. Baumann in the course of a speech at the annual meeting of the Rubber Share Trust & Finance Co., of which he is chairman. He spoke in part as follows:

"With regard to the prospects of the rubber industry on which our revenue depends, we may consider it from two points of view. There is first of all the ultimate prospects of prosperity and there is the present, or immediate future, of the industry to be considered. Of the ultimate prospects of solid success for the rubber industry I think no reasonable man can entertain a doubt. What are the two essential factors of a commercial success? They are the production of a basic commodity, and at such a cost as will leave a substantial profit. Both these essential factors are present in the rubber industry. Rubber, if not a basic commodity in the sense that sugar and wheat are, is, at all events, as necessary to modern civilization as copper, and I think that if you cannot call it a basic commodity today it certainly will become one in the immediate future.

"With regard to cost of production there can be no doubt that the good rubber companies—those which are not over-capitalized and which are well administered—will, when they are in full bearing, reduce their all-in-costs to something like 9d. per pound at least. It would, therefore, seem a mere arithmetical sum to infer that when our total area is in bearing our all-in-costs will be reduced to something like 9d. per pound, and with that cost I have no hesitation in saying that there is a very substantial

margin of profit for the shareholders and for the owners of shares in rubber companies.

"With regard to the immediate future of the industry, I am bound to say that the adverse factors seem to predominate for the moment over the favorable ones, but I see no reason why we should be unduly pessimistic. The adverse factors are, of course, found in the increase of production accompanied by a diminution in certain quarters of consumption owing to the war. The estimated output from the plantations for the current year is 65,000 tons of rubber. Although I do not think that estimate will be realized, the probability is the amount will not be very far short of that figure. The estimated output of the plantations for the year 1915 is 85,000 tons, which I do not believe for a moment will be realized—for various reasons. But if you put the output of the plantations for 1915 at 85,000 tons it means an increase on the present production of 20,000 tons.

GERMAN REQUIREMENTS.

"Now, Germany is in the habit, or has been for the last two years, of consuming some 20,000 tons of rubber, of which about 10,000 tons have come from the plantations in the East. Well, I need hardly point out to you that you cannot increase your output by 20,000 tons and decrease your demand by 10,000 tons without having an adverse effect upon the market for the commodity. Against this may be set off one factor, and that is the increased consumption for war purposes by the Allies. There is no doubt that this war is very largely a motor war, and we can confidently anticipate a largely increased demand for rubber by Great Britain, France, Russia and the United States. But despite the difficulties of trading with Russia, there is already noticeable an increased demand by that country for rubber, which is not surprising, because the Russian soldiers are equipped with rubber boots, as ours ought to be, and there is, of course, very great wear and tear on tires. I am told that our manufacturers are working double shifts in making rubber sheets for our soldiers. So much for the increased consumption for war purposes.

"Secondly, we may look for diminished supplies of rubber, particularly from Brazil. Now, I have got some figures on that point which are really rather remarkable as showing the decrease of imports into this country during the nine months ended September 30. I find that to September 30 there were imported into Great Britain from all countries 49,442 tons of rubber as compared with 52,268 tons of rubber in the same period in 1913. The re-exports on the other hand from this country were larger in 1914 than they were in 1913. The re-exports from this country during the first nine months of the current year were 37,308 tons, as compared with 32,942 tons in 1913; leaving—and this is the important point—a net quantity for home use of 12,134 tons, as compared with 19,326 tons in the previous year, 1913—which, I think, is a very remarkable figure. Another consoling fact is that our re-exports to France and the United States for the current year are in excess of those which we sent them in the year 1913. In 1914 we re-exported to France 4,388 tons, as against 3,541 tons in the previous year, and to the United States of America we re-exported 17,257 tons as compared with 12,797 tons in the year 1913; so that we have to set off against what I call the unfavorable factors, the war and so on, the undoubtedly favorable fact that supplies from Brazil and from Africa are diminishing and that our re-exports to the United States, to France, and to Russia are increasing. But still I think you will find in the steady prices in the market that that fact is reflected"

FINANCIAL TALK

The financial situation of the rubber industry in the United States is generally regarded as being in a state of depression. The demand for rubber has been falling steadily since the beginning of the year, and the price of rubber has been falling correspondingly. The rubber industry in the United States is a highly competitive industry, and the falling price of rubber has had a serious effect on the industry. The rubber industry in the United States is a highly competitive industry, and the falling price of rubber has had a serious effect on the industry. The rubber industry in the United States is a highly competitive industry, and the falling price of rubber has had a serious effect on the industry.

LATE STAGES OF RUBBER

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JANSSEN & HYMAN

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TRADE RESTRICTIONS AND CONTRABAND

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SOME RUBBER INTERESTS IN EUROPE.

RUBBER IMPORTS AT BORDEAUX.

IMPORTS of rubber at Bordeaux for 1913 represented 2,543 tons against 3,484 tons in 1912.

The reduction in quantity was due to the fall in prices, which dropped during the period from March to September, many importers ceasing their operations at sources of supply. Business in Guinea and Ivory Coast rubber only recommenced towards the close of the year, when the natives were willing to sell in small lots. Imports of balata in 1913 showed a marked increase over the quantities of 1912, but prices were unsatisfactory owing to the irregularity of quality.

THE B. F. GOODRICH CO. IN FRANCE.

The French factory of The B. F. Goodrich Co., at Colombes, is now being operated under the direction of the Government of France, and its entire output of tires is being used on Government automobiles.

A GERMAN RUBBER FACTORY IN FRANCE CLOSED.

The plant of the Continental Société Anonyme, at 146 Avenue Malakoff, Paris, has been closed by order of the French Government. This company is a branch of the Continental Caoutchouc & Gutta Percha Compagnie, with headquarters in Hanover, Germany, and its factory has been looked upon with suspicion for the past two years by some of the leading French concerns, who claimed that it was being used as a base of operation for an extensive spy system particularly interested in military and aeronautic operations. On the outbreak of the war all the German members of the firm went back home, the only French member, Maurice Echalié, being left to conduct the operation of the plant. Its entire output and stock have been requisitioned by the government.

RUSSIAN GOVERNMENT IN THE MARKET FOR AEROPLANES.

Robert Pluym, who visited New York early in November, registering from Petrograd, is said to have announced his purpose in visiting this country to be the purchase of automobiles and aeroplanes for the Russian Government.

AMSTERDAM RUBBER IMPORTS.

While in 1907 the receipts of plantation rubber at Amsterdam only amounted to a nominal quantity, the total for 1913 rose to 1,039 tons, composed of the following sorts: *Hevea*, 839 tons; *Ficus*, 151 tons; miscellaneous varieties, 49 tons. This result is attributed by the British Consul to the increasing production of Dutch Indian estates, as well as to the favorable prices realized under the system of inscription sales at Amsterdam.

DENMARK'S RUBBER AND CABLE INDUSTRIES IN WAR TIMES.

In reply to a circular inquiry from the Danish Industrial Council, the Scandinavian Rubber Co. of Odense reported in September that rubber had been ordered from England and it was hoped to get it through by one of the Danish steam lines. Other raw materials were in stock to the extent of six months' requirements. Sales of rubber manufactures were difficult and large orders were not looked for.

The Northern Cable & Wire Works, of Copenhagen, stated that it was at present well provided with work. At the outbreak of the war it had large cable orders on hand, which were increased by the further contracts taken in consequence of the military preparations and the lack of communication with foreign sources of supply.

ITALY'S RUBBER IMPORTS.

According to a consular report on Italian imports of crude rubber and gutta percha presented \$9,000,000 in 1912 and \$9,364,448 in 1913. The proportion from the United States equaled: 1912, \$28,126; 1913, \$172,349. The volume imported for five months ending May was as follows: 1912, 1943 tons; 1913, 1365 tons; 1914, 2,276 tons.

THE GENERAL SITUATION IN GERMANY.

LETTERS received in this country from Germany show that the German rubber industry has stood the shock of war fairly well, but is far from good except in certain lines. The great demand for tires has favorably affected the turn-out of tire works, and many of them have actually now more work on hand than would be the case under normal conditions. The German war office, when war seemed inevitable, made arrangements with some of the leading firms to supply all tires in stock and to accept large orders for immediate delivery. The tire manufacturers holding stocks of tires in Germany have been compelled to hand these over to the government.

The fertile mind of the German rubber manufacturer apparently has accommodated itself quickly, with that adaptation which is one of the main reasons for the enormous development of German exports during the last years, to the conditions created by the war and soon the trade press began to carry advertisements of supplies of war material. A great demand for surgical instruments and rubber sheets has arisen, and will most likely continue until cessation of hostilities. Germany has been in the habit of buying large quantities of surgical instruments from England, and even American houses have been able to send such goods to Germany. The large demand which has sprung up during the last months must now be covered by home production entirely, which puts considerable pressure on the rubber manufacturers, especially as they have to solve the problem of larger production with a reduced number of workmen.

Germany has bought large quantities of rubber goods every year from England, the United States, Belgium, France and Italy. Even taken in consideration that the demand which has increased in some departments has fallen off in others, it is clear that a large part of those goods which came formerly from the countries now at war with Germany will either have to be supplied by friendly countries or must be manufactured in Germany. The last eventuality alone seems to have been sufficient to balance the loss in the home trade.

Nevertheless, there has been an enormous falling off in manufacturing activity, as practically the whole of the export trade has come to a standstill. The inability of Germany to hold the sea has made it impossible or at least difficult to carry on direct trade with neutral countries. In addition to that Germany misses the support of the London market in the business which formerly has been arranged by London merchants for German account or has been supplied by Germany filling orders for London shippers. German manufacturers are of the opinion that most of this trade will come back after the war, as it will be difficult for other countries, with the exception possibly of the United States, to replace those goods.

Nearly all the leading firms are keeping their works going, but in a few cases it has been necessary to shut down some of the departments.

A NEW GERMAN SEAMLESS DRESS SHIELD.

A sample has been registered by Ferdinand Henke, of Hanover, of a system for making seamless dress shields by means of a flat dipper made of wood or glass, provided with a handle, the head of which is rounded off and the lower edge cut out. Any desired number of dippers can be fastened in a shaft and dipped in a fluid dipping solution. The solution adheres to the dipper when removed, being dried and subsequently vulcanized. The finished product is formed into a seamless dress shield. In this way it is claimed that a seamless dress shield in one piece is produced.

SAVING IN WEAR OF RUBBER HEELS.

A collection of small samples has been prepared by the Rubber Institute of the German Rubber Association. In these small pieces of material are arranged small metal sunk heads to prevent them falling out.

RUBBER SOLVENTS IN GERMANY DURING THE WAR.

IN addition to a shortage of rubber in Germany it appears that the question of solvents is also pressing. With characteristic thoroughness the German scientists are studying this lesser phase of the rubber problem and trying to find a solution.

One might think that with the import of crude rubber absolutely shut off this all important question would entirely occupy the German mind, but not so. The smallest detail is carefully worked out by the scientist in co-operation with the government or with the large firms.

It must be remembered that Germany produces practically no petroleum within her borders, that Austria-Hungary in the province of Galicia is a large producer, but that this province was overrun by the Russians, who have seemingly retreated from some parts; but it is safe to say that what they left was not of much value, and production will be crippled there for a long time. Rumania seems to be becoming also more unfriendly since the death of the ruler, so that the gasoline problem is increasingly more serious. This war is fought on gasoline as the motive power to a large extent.

Germany has an immense coal tar industry, but this consists in manufacturing the crude materials into high-priced articles like dyes and medicines. Germany has for years imported from England a large amount of crude coal tar products. Therefore the coal tar products will be substituted for gasoline for motors; but this is only a drop in the bucket compared with the gasoline requirements. As showing the recognition of this condition and the preparation for it it is said that the Committee on Provision of War Necessities which was appointed by the German Government to look out for the future needs started up the Belgian coke ovens at Liege within two days after the Germans took the town. This will furnish coal tar as a by product, which will in turn furnish the benzol and motor spirit.

Dr. Fr. Frank and Dr. E. Marckwald, of Berlin, have discussed this problem in the columns of "Gummi Zeitung" of recent date. Some of their remarks will be abstracted here, as they may supply useful hints for the American trade and will at least inform us of what is being done abroad.

Coal tar benzol mixed with gasoline has been extensively used in motors in France and Germany, as have also alcohol and benzol mixed and separate; but alcohol only furnishes about six-tenths the power per gallon that gasoline does. The German Government took possession of all stocks of benzol and gasoline on the outbreak of the war, so that all manufacturing of rubber articles requiring solution stopped. Plants with government contracts were allowed to use some solvents when necessary, but were obliged to exercise caution and not waste anything.

It is now thought that Germany and Austria may be able to supply some substitute products. With this in view an effort will be made to use those less volatile. It is believed that the Xylenes, which boil at about 140 deg. C., would be suitable solvents and might be supplied at a reasonable price. It is said that there is no hope of the rubber manufacturers getting any benzine, or what we call naphtha, except what is allowed to those who are working on government contracts.

Carbon tetra-chloride is discussed, but as it is remarkably heavy and the fumes and vapors are disagreeable, it is thus objectionable, and while it dissolves crude rubber satisfactorily yet in cold vulcanization it penetrates deeply and the product is usually too hard. Fusel oil is also thought of, but its supply is too limited. The terpinene is also mentioned with the statement that their boiling point is too high.

Carbon bi-sulphide is also recommended in spite of its odor

and poisonous character, and the danger of fire. It is said that industrial hygiene has progressed in Germany to such a point that this can now be used with safety. Mixing with carbon tetra-chloride is recommended so as to reduce danger of fire.

In a later article these same authors state that as the supply of benzine (or gasoline) has been found to be sufficient for use in the army, some benzol may be supplied to the rubber manufacturers, who will thus be enabled to continue operations. The objections to benzol and xylol have been overcome to a great extent by the rubber manufacturers though these are found to retain water much more than the naphthas.

A mixture of equal parts of carbon bi-sulphide and carbon tetra-chloride having a specific gravity of 1.4123 has been found to be the most suitable mixture of these two solvents, but fire risks are not entirely eliminated and the odors are quite disagreeable. Five per cent. alcohol added to this mixture is said to have remarkable influence on the solvent properties and the viscosity. Considerable quantities of rubber are said to dissolve in this mixed solvent in a few minutes, forming a clear and thin solution. Fear is expressed that the alcohol mixture may cause some trouble on account of the residue of water thus introduced into the rubber. The experiments were made with absolute alcohol. The latest information is that heavy benzine will be allowed to be used in technical work.

GROWTH OF GERMAN RUBBER IMPORTS.

Recent figures of the German Statistical Office show that the national population has grown from 62,900,000 in the middle of 1908, to 67,800,000 at the same period of 1914, being an increase of 4,900,000, or more than 7 per cent. This increase of population has been accompanied by a growth in the imports of raw materials, particularly rubber.

German rubber imports for the last 5 years were:

	Quantity	Value
1909	15,500 tons	\$33,700,000
1910	18,700	55,500,000
1911	20,000	42,387,500
1912	20,600	40,675,000
1913	20,500	24,800,000

Within the last 5 years the German imports of rubber have thus increased in quantity, while they show a falling off in value.

Exports from German East Africa, Camerun and Togo represented: 1909, 2,138.7 tons; 1910, 2,840.4 tons; 1911, 3,709.5 tons; 1912, 4,180.2 tons.

GERMANY'S CABLE EXPORTS.

According to English statistics, the total German exports of electrical machinery and apparatus for 1913 represented a weight of 133,855 tons and a value of \$69,000,000; of which land cables weighed 47,571 tons and had a value of \$9,550,000. The chief countries to which this quantity was exported were: Holland, 6,955 tons; Argentina, 6,835; Norway, 3,655; Japan, 3,724; Dutch Indies, 3,616; Sweden, 2,281, and British South Africa, 1,195—the exports to these countries representing about 70 per cent. of the total weight. In addition, there were 4,739 tons of submarine cable exported. German electrical exports had increased in 1913 about 50 per cent. since 1910.

SHOW CASE FOR RUBBER HEELS AND TIPS.

A German has recently taken out a patent in his country for a show case constructed to hold all the different sizes of rubber heels and tips made for the German trade. The purpose of the case is to make it possible for the salesman to find in a moment the exact size of heel or tip required.

THE RUBBER TRADE IN JAPAN.

By Our Regular Correspondent.

A STATISTICAL return lately issued by the Japanese government showed an increase both in quality and value of rubber imports for 1913 as compared with 1912. The following are the details with sources:

COMPARATIVE JAPANESE RUBBER IMPORTS OF 1912 AND 1913.

From—	1912—		1913—	
	Pounds.	Value.	Pounds.	Value.
British India	167,063	\$140,781	340,343	\$239,281
British Straits Settlements	1,214,485	820,891	1,657,265	885,602
Dutch Indies	124,904	73,171	13,928	8,908
Great Britain	242,620	230,663	440,802	408,865
Germany	25,600	19,307	15,425	10,425
United States	158,176	160,556	139,624	100,112
French India	3,805	3,874	4,464	3,032
Other countries	67,377	65,314	70,092	69,697

Total 2,004,030 \$1,514,557 2,681,943 \$1,725,922

Increase in 1913 about 33 per cent. in quantity, 14 per cent. in value.

The progress made by the Japanese rubber industry has been largely due to the manufacture of jinrikisha and bicycle tires, which had hitherto been generally imported. Among the companies which have gone ahead in this line are: the Kakuichi Rubber Co., of Osaka; the Yokohama Electric Wire Works, of Yokohama and Osaka; the Nipon Electric Wire & Cable Co., of Tokyo; the Sumitomo Electric Wire Works, of Osaka, and the Settsu Rubber Co., of Hyogo. The recently established companies include the Taisho Rubber Manufacturing Co. and the Naigai Rubber Co., both of Kobe.

Owing to the development of the industry at Kobe and Osaka the total imports of crude rubber at these points now surpass those of Yokohama, as shown by the following table:

APPROXIMATE RECEIPTS OF RUBBER AT PRINCIPAL JAPANESE PORTS.

	1912—		1913—	
	Pounds.	Value.	Pounds.	Value.
Yokohama	1,023,052	\$826,580	1,228,710	\$851,814
Kobe	970,897	676,850	1,438,893	862,483
Osaka	10,081	11,127	14,037	11,319
Nagasaki			303	306

Total 2,004,030 \$1,514,557 2,681,943 \$1,725,922

Eighty per cent. of the 1913 crude rubber imports from Singapore consisted of plantation. While the fall in prices caused an augmented import in 1913, many crude rubber importers are said to have lost heavily. The imports of hard fine Para were reduced owing to competition of plantation rubber. In consequence the receipts from the United States declined. Imports of African rubber fell off in 1912 and were altogether lacking in 1913, on account of the fall in plantation prices. Generally speaking the imports of crude rubber were in 1913 well taken up by consumers at the following prices:

FLUCTUATIONS OF RUBBER IN JAPAN, 1913.

Variety—	Jan.-Feb.	Sept.	Oct.-Nov.
Borneo	yen 1.60 (80c.)	yen 1.25 (63c.)	yen 1.35 (68c.)
Indian	yen 1.60 (80c.)	yen 1.20 (60c.)	yen 1.00 (50c.)
Plantation sheet	yen 2.25 (\$1.13)	yen .95 (48c.)	yen 1.20 (60c.)
Pará	yen 2.50 (\$1.25)	yen 1.80 (90c.)	yen 1.70 (85c.)

BICYCLE IMPORTS, 1913.

Japanese imports of bicycles and parts in 1913 amounted to \$1,586,492, as compared with \$1,558,118 in 1912, the net increase being \$28,374.

Japanese exports during 1913 included insulated electric wire \$47,060 (principally for China) and jinrikishas and parts \$358,141. The largest exports of the latter were to the British Straits Settlements. Exports of complete carriages fell off in consequence of business depression in Singapore and British India, while in Hong Kong and Annam many manufacturers are constructing jinrikishas from imported parts.

DISSOLUTION OF TOHAN RUBBER CO.

Having accomplished its purpose, the Tohan Rubber Co., formed in February, 1914, was dissolved on August 31. It was composed of five medical rubber tubing manufacturers and nineteen dealers, with the object of bringing up the prices of the article by clearing off the makers' stocks.

JAPANESE RUBBER IMPORTS AND EXPORTS.

THE report of United States Deputy Consul General J. W. Ballantine, of Yokohama, on Japanese foreign trade gives the total Japanese imports for 1912 and 1913 as \$308,258,154 and \$363,256,960, and the total Japanese exports for these two years \$262,436,957 and \$314,965,186. The Japanese imports for the two years from the United States amounted to \$63,253,847 and \$60,959,364, and the exports to the United States to \$84,017,030 and \$91,868,612.

The part of the report devoted to Japanese rubber imports and exports is particularly interesting. The chief imports of rubber manufactured goods into that country for 1912 and 1913 are shown in the table below:

CHIEF RUBBER IMPORTS INTO JAPAN.

Insulated electric wire:			
From	1912.	1913.	
United States	\$129,912	\$47,836	
Germany	1,237,458	706,495	
Great Britain	1,305,778	244,638	
Other countries	10,265	2,567	
	\$2,683,413	\$1,001,536	
Tires chiefly for bicycles:			
From	1912.	1913.	
United States	\$22,609	\$8,835	
Great Britain	526,111	492,387	
Germany	4,100	15,774	
Other countries	1,630	277	
	\$554,450	\$517,273	

Imports from United States included:	1912.	1913.
Crude rubber and gutta percha	\$159,914	\$90,712
Rubber boots and shoes	41,285	41,845
Manufactures not otherwise specified	284,464	241,152

The aggregate Japanese imports of india rubber and gutta percha were: 1912, \$1,508,502; 1913, \$1,719,019. Of this total the United States furnished: 1912, \$159,914; 1913, \$90,712. Every year shows an increase in the Japanese imports of rubber, about one-half of which comes from the British Straits Settlements.

Among the exports sulphur amounted in 1912 to \$869,147; in 1913 to \$986,456. Of this aggregate the United States received: 1912, \$443,603; 1913, \$358,457.

Japanese imports and exports, it will be noticed, both showed for 1913 an increase of about 20 per cent. above 1912. Trade with the United States alone, on the other hand, displayed a reduction in imports of 5 per cent. and an advance in exports of 8 per cent.

YOKOHAMA RUBBER IMPORTS.

A consular report for the years 1912 and 1913 shows the following imports of rubber at Yokohama.

	Tons.	Value.
1912	532	\$823,274
1913	614	848,407

It will interest American manufacturers to know that the Japanese government proposes to lay a cable between Nagasaki and Shanghai.

The permanent market committee of the Rubber Growers' Association has discontinued the recording of plantation rubber weights in hundredweights, quarters and pounds, having substituted pounds for the other denominations.

PLANTATION RUBBER INDUSTRY AND THE WAR.

ACCORDING to a communication from M. N. Le Coispellier to the "Annals of Indo-China Rubber Planters," the rubber trade, in common with business in general, was surprised at the sudden breaking out of the war in the closing days of July last, when sales ceased in the East. Penang and Singapore held their last auctions previous to the war on July 28. They showed a lack of activity under the influence of the European cables, which left but small hope of maintaining peace. Sales were resumed rather timidly on August 12. The last sale before the war was held at Ceylon on July 31, when the situation was such that the principal sellers withdrew their offerings, some private sales being afterwards made at prices equaling between 48 and 49 cents (American currency) per pound.

On the suspension of sales the planters of the Malay Peninsula lost no time in devising plans for meeting the situation. Messrs. Skinner and Macfadyen, former and present presidents of the Planters' Association of Malaya, went to Singapore to call the attention of the government to the prospective effect of the altered conditions on the plantation industry. A general meeting of the association was also held August 6, at Kuala Lumpur, to discuss the steps to be taken.

After an ineffectual attempt to obtain the co-operation of financial institutions, an arrangement was made by which both in the Federated Malay States and in the colony of the Straits Settlements the respective governments would make cash advances to the estate owners for the purpose of at least feeding the laborers, while official intervention would be used to persuade the latter that it was in their interest to remain on the plantations on the terms which would be offered them.

To cover these advances the government would receive consignments of first quality rubber, on which advances would be made at a rate equaling about 18 cents American currency per pound, or listed securities. In certain special cases loans would be made on personal guarantees. The requirements of the Federated Malay States for making these advances in money or rice were met by the help of the Straits Settlement colony, which took over shares from the Federated Malay States, which it would have been difficult to sell in present conditions, but which the colony was in a position to handle, having acquired a considerable stock of gold.

The principal anxiety of the planters was lest they would be unable to retain their coolies (estimated at 270,000), hence addresses were delivered in the various districts urging the laborers to accept the temporary conditions offered them for keeping the estates in good shape and doing a small amount of tapping.

According to M. Le Coispellier's statement, a large number of estates on the east of Sumatra belonging to English and German planters decided to cease operations, leaving to their own resources their 30,000 to 40,000 coolies, who were obliged to return to Java.

The efforts made on the Malay Peninsula to open up new outlets for rubber, in order to replace those closed in Europe, are spoken of as being all the more opportune, as there is a certain slackening of the English rubber industry and almost a total cessation in France, Belgium, Russia, Austria and Germany.

It is added that the horizon is becoming clearer for the rubber industry in general, and particularly for producers, the maritime commercial routes remaining free, which enables the raw material to be brought in security to the markets. The unprecedented assumption of rubber for the pneumatic tires of automobiles for military purposes will alone form an important outlet. This situation, the planters believe, cannot fail to react on the price of the raw material, all the more as, owing to the uncertainties of the opening of the campaign, a slackening of production took place which may lead to a scarcity of product. The hope is expressed that the reaction will not be sufficient to

bring back low class wild rubbers to consumption. Had plantation rubber not continued to reach the markets, manufacturers would have tried to promote the cultivation of lower grades in Brazil.

Regarding the Indo-China plantations M. Le Coispellier remarks:

"The question of labor not having to be met at present, our policy should be to continue as we have begun, so as to be ready to benefit by the increase of price which will certainly take place in Europe after the war, when the rubber industry there will be revived—pacified for a long time to come.

H. F. MACMILLAN, F. L. S.

"THE most beautiful gardens in the world" is the way a great many tourists describe the Royal Botanic Gardens at Peradeniya, Ceylon. However that may be, these gardens are certainly, from the rubber standpoint, the most interesting and important anywhere in the tropics. They have achieved this distinction through the intelligent work of the long line of well trained and conscientious scientists who since the Gardens were first started, in 1821, have devoted their lives to the success of agriculture and horticulture in the British tropical colonies.

On the retirement of Mr. J. C. Willis in December, 1911, H. F. Macmillan, F. L. S., was appointed superintendent of these Gardens. He received his early training at the Royal Botanic Gardens, Kew, London, and at the Royal College of Science, South Kensington, London.

The Secretary of State for the Colonies made him Curator of the Royal Botanic Gardens at Peradeniya in 1895. He began at once to develop new features, transforming a portion of the grounds into an extensive floricultural section, now easily the most popular and attractive feature of the Gardens.

He is well known as the author of numerous pamphlets and bulletins on botanical, horticultural and agricultural subjects, including "Notes on Ceylon Botany," "Illustrated Guide to the Royal Botanic Gardens, Peradeniya" (an elaborate publication now in its second edition) and the familiar "Handbook of Tropical Gardening and Planting." The first edition of the latter, of which the Government of Ceylon purchased a large number of copies, was sold out within ten months of its publication. A second and much enlarged edition containing some 300 illustrations (mostly from photographs taken by the author) is now out of the press. Another work recently completed is an illustrated bulletin on "The Use of Explosives in Agriculture," while he has in hand the preparation of a "Classified Catalog of the Collection at the Royal Botanic Gardens, Peradeniya."

Mr. Macmillan was secretary of the All-Ceylon Exhibition of 1912, the largest exhibition ever held in Ceylon, and in recognition of his services in this capacity he was presented with a special gold medal. He was promoted to the office of Chief of



H. F. MACMILLAN.

Division of Botanic Gardens in Ceylon on the resignation of Dr. Lock, under the new Department of Agriculture so ably presided over by Mr. Lyne.

With little time for hobbies, he has managed to specialize to some extent in photography, and possesses doubtless the largest collection of photographs of botanic and agri-horticultural subjects in Ceylon. He has won many medals, cups, etc., for photography at exhibitions, the latest being a first prize of £25 offered by the "India Rubber Journal" at the London Rubber Exhibition for a series of photographs showing the production of plantation rubber from seed to shipment.

He devised, in the early days of rubber planting, a method of transporting rubber plants and seeds over long journeys, for which a gold medal was awarded at the first rubber exhibition

held in Ceylon, in 1906. As a result of this, rubber plants were successfully distributed from Ceylon to practically all parts of the tropical world, including even Brazil and other parts of tropical America. He was closely identified with the introduction of different kinds of rubber into Ceylon in the early days of rubber and with the spread of information regarding their cultivation and prospective merits.

While Mr. Macmillan has devoted himself to tropical botany for so many years, he still finds time for an occasional game of golf, and, as a matter of fact, he laid out, on a very rugged and apparently unpromising piece of land, the popular and picturesque links of the Kandy Golf Club, of which he has been made not only Honorary Ground Secretary, in recognition of his services, but an honorary life member.

Some Rubber Planting Notes.

CEYLON CHAMBER OF COMMERCE REPORT.

THE report of the Ceylon Chamber of Commerce for the half year ending June 30, 1914, showed the exports of rubber for the first six months of the last three years to have been as follows: 1912, 5,697,133 pounds; 1913, 10,498,434 pounds; 1914, 17,368,591 pounds.

Attention is called to the fact that Ceylon rubber exports continue practically to double each year.

Regarding distribution, it is remarked that the local Colombo market is capable of dealing with much larger supplies than have hitherto been available, enjoying, as it does, special facilities for direct shipment to all the principal rubber markets in the world. It is added that it is a matter of conjecture, whether rubber produced in other Eastern countries will be consigned to Colombo for sale, but it is considered that Ceylon grown rubber can undoubtedly be dealt with to advantage locally.

There is room for improvement in the matter of grading and packing, especially on the former point. Good parcels are frequently diminished in value by a small proportion of "rocky" pieces, a defect which might easily be overcome by additional factory supervision. The adoption is recommended of some generally accepted uniform method of sorting, thus arriving at standardization. In this way operations with the consuming markets would be facilitated; the reasonable requirements of manufacturers being met by eliminating a number of the sorts and varieties at present brought to market.

Mr. William Moir, the chairman, was re-elected for another year.

CEYLON RUBBER EXPORTS.

According to the report of the German Imperial Consulate at Colombo, the year 1913 was a critical period for the rubber industry of Ceylon. The price at the beginning of the year equaled \$1.06 United States currency per pound, and fell in September to the equivalent of 48 cents per pound. The quantity exported in 1913—about 28 million pounds—was distributed as follows: To Great Britain, 15,238,000 pounds; United States, 6,572,000 pounds; Belgium, 4,124,000 pounds; Germany, 431,449 pounds; other countries (about) 1,634,551 pounds.

THE AGAR SMOKING APPARATUS.

C. Alma Baker, of Perak, one of the largest planters of the Federated Malay States, lately visited R. S. Agar's Ceylon estate to see the operation of the Agar smoking machine. Mr. Baker was of the opinion that the Agar machine, with slight alterations, would prove exceedingly valuable to the planting industry. Its absolute simplicity constitutes its chief merit. The rubber is coagulated in a receptacle, through which there passes a large cylinder which carries the smoke through the latex, the latter being either completely coagulated into lump or drawn off before complete coagulation, put into pans and made into the standard required for the market. The machine takes 125 gallons of latex

at a charge, which requires from 20 to 30 minutes to coagulate, giving in a 10-hour day 3,000 pounds of dry rubber or 6,000 pounds with one smoking chamber for two machines.

The rubber produced by the Agar process is said to be very clear. No acetic acid is required, it being claimed that for this reason the rubber contains much more of the essential qualities than when obtained by the use of acid.

RUBBER CULTIVATION IN INDIA.

Rubber production in India is confined to Assam, Burma and the Madras Presidency. Statistics for the fiscal years ending March 31, 1913 and 1914, are as follows:

	1913.	1914.
Assam	52 tons	24
Madras	444	798
Burma	235	341
Total	731	1,163

While Burma heads the list in acreage and number of trees planted, most of these trees, being less than six years old, are at present unproductive. Burma has 29,544 acres under rubber with 4,911,399 trees; while Madras has 12,022 acres, with 1,636,476 trees, and Assam, 4,681 acres, with 137,430 trees. The rubber production of Madras is thus at present more than double that of Burma.

JOHORE'S PROGRESS.

According to an official report on Johore for 1913, the revenue equaled in United States currency \$2,451,991, with an expenditure equalling \$2,435,239. The imports represented \$5,240,525 and the exports \$7,959,196.

The principal events which marked the progress of 1913 in Johore were the fall in rubber prices and the consequent readjustment of payment for labor. Owing to the former cause, the opening up of new lands for rubber cultivation by European companies nearly ceased, while the Japanese during the year added 11,000 acres to their existing cultivated areas. Many European estates were thus able to discharge a number of coolies, this large available supply of labor resulting in a reduction in the scale of wages.

The export returns of other agricultural produce displayed no marked variation as compared with previous years, rubber forming a notable exception, the production having risen from 22,000 pikuls (2,933,333 pounds) in 1912 to 46,000 pikuls (6,133,333 pounds) in 1913, an advance of about 109 per cent. It is thought that this rate of increase may possibly be maintained during the next few years, as the large areas planted in 1911 and 1912 reach maturity, but with the spread of more rational ideas as to the conservation of bark a reduction in output would naturally result. Areca nut plantations have been in some instances cut down to make room for rubber.

HALF SALARIES TO EUROPEAN ESTATE MANAGERS.

At a recent meeting of the Planters' Association of Malaya, a proposal was made for reducing the salaries of European managers and assistants. It is reported that in some cases Europeans were placed on half salaries, but the hope has been expressed that when estates revert to full payment of coolies wages the remuneration of the officials will follow suit. The establishment of a system of retail cash trading was likewise advocated, as possibly leading to an appreciable reduction of living expenses. In fact, the continuance of the cash arrangements now in force is recommended, in place of the previous credit system.

GERMAN EAST AFRICAN PLANTATIONS.

During 1913 the rubber plantations of the Amani Biological Station were considerably developed. *Manihot* seeds were produced in greater quantity than was found needful, the demand having slackened. A great number of the older trees were broken by the wind. *Hevea* was well developed, seeds and plants being abundantly distributed. A certain number of old trees was lost through the ravages of parasites on their roots. *Ficus elastica* prospered, particularly the Sumatra variety with small leaves. The older plantings of *Castilloa* have been given up, as they were found to produce an inferior latex, but the seeds imported from Saigon and Costa Rica have produced other trees which can soon be tapped. A large number of vines has been planted in the gardens of the Amani institute. Cultivated gutta percha has yielded relatively good results, but the flowering has in some cases been slow.

DUTCH INDIAN RUBBER PRODUCTION.

A British consular report gives the following details of the exports of the different varieties of rubber from Java within the last two years:

	1912.	1913
<i>Hevea Brasiliensis</i>	485	2,339
<i>Ficus elastica</i>	475	124
<i>Castilloa</i>	23	43
Ceara	1/2	11
Other varieties	34	46

Total	1,017 1/2	2,563
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The falling off in exports of *Ficus* is attributed to the fact that many trees of this variety have been cut out by planters, who now pin their faith to *Hevea*. Statistics issued by the Java department of agriculture showed that in January, 1913, there were 220,578 acres under rubber in Java, of which 187,535 were in *Hevea*.

RUBBER EXPORTS FROM SUMATRA.

Rubber exports from the east coast of Sumatra have largely increased during the last four years, having been: 1910, 539 tons; 1911, 813 tons; 1912, 1,807 tons; 1913 (estimated) 3,020 tons. Of the 230,075 acres under rubber in 1913, 220,005 were in *Hevea*.

Owing to the low price of rubber in 1913, the extension of planting was checked in Sumatra, the tapping of new areas being postponed and close attention directed to reducing costs of production. Many of the older producing estates seem to have reduced their cost at point of shipment to 8d. (16.21 cents) per pound while in some cases a further slight reduction is anticipated on this figure when the trees are in full bearing.

EXPORTATION OF ADULTERATED RUBBER FROM BELGIAN CONGO PROHIBITED.

A Belgian Royal Decree prohibits the exportation of adulterated and impure rubber from the Belgian Congo, rubber of the prohibited character being subject to confiscation. All rubber presented for exportation must be accompanied by a certificate of purity.

OPENING OF THE BATAVIA EXHIBITION.

THE "Indische Mercur" of October 23 contained a Reuter's cable from Batavia to the effect that the Governor General had just opened the International Rubber Exhibition. It was added that almost all nations were represented.

A number of papers were to be read at the exhibition, including the following:

"What Rubber Manufacturers Want in Crude Rubber," by H. C. Pearson, Editor of THE INDIA RUBBER WORLD.

"The Significance of Branching in Young *Hevea* Trees," by W. J. Gallagher.

"Planting Distances for *Hevea*," by C. M. Hamaker, Kiara Pajoeng, Java.

"Tapping and Tapping Systems," by F. G. Spring, Kuala Lumpur, F. M. S.

"The Planning of Manurial Experiments," by W. Barrowcliff, Asst. Agr. Chemist, Dept. of Agriculture, F. M. S.

"Catch Crops and Inter-crops," by R. W. Munro.

"Catch Crops with *Hevea*," by Dr. C. J. J. van Hall, Buitenzorg, Java.

"Diseases of *Hevea*," by Dr. C. J. J. van Hall and Dr. A. A. L. Rutgers, both of Buitenzorg, Java.

"Preparation of Rubber of Light Color," by Dr. A. J. Ultee, Djember, Java.

"Manuring of *Hevea*," by Dr. A. J. Ultee, Djember, Java.

MR. LAMPARD ON FORWARD SALES.

At the last meeting of the Sialang Rubber Estates, Mr. C. A. Lampard urged the advisability of forward contracts for crude rubber. One reason was the need of affording the manufacturer the opportunity of providing for his future requirements. Were this denied him, he would buy wild rubber, which is what plantation owners desire to prevent. Their policy was to get their rubber into all the world's factories, and this end could best be accomplished by selling ahead a portion of their output as they found a means of doing so.

SELECTION IN HEVEA.

In dealing with this subject, the "Tropical Agriculturist," of Colombo, remarks that as the rush of planting is over the selection of seed is a point calling for the careful attention of rubber companies.

The pre-eminence of Java in cinchona has been attributed to the selection of the highest yielding trees. At Peradeniya two acres have been planted in rubber with seed from the old Heneratgoda tree which yielded 386 pounds of dry rubber in 4½ years. When old enough to tap, the yields will be carefully recorded and any poor producers removed, selection being based on yield.

It has been proposed for estates to set aside one or two acres to be planted with seeds from the trees which have shown the best yields. Any trees which have proved below the standard would be cut out, so as not to risk deterioration in the succeeding generation.

SPOTTING OF RUBBER.

In a bulletin on the above subject, Mr. A. Sharples, Assistant Mycologist of the Department of Agriculture, Federated Malay States, remarks that the spottings and discolorations in plantation rubber are mostly due to common saprophytic fungi.

Rubber prepared from latex diluted with water shows a greater tendency towards spotting than that from undiluted latex. Any addition of coagulant above the minimum necessary also increases this spotting tendency.

BRAZIL'S NEW PRESIDENT INAUGURATED.

Dr. Wenceslau Braz Pereira Gomes was inaugurated President of Brazil on November 15, at Rio Janeiro. The ceremony, which took place in the Senate Chamber, was attended by members of Parliament, the diplomatic corps and many prominent citizens.

MIGUEL P. SHELLEY.

AMONG the interesting people who have recently come to New York is Mr. Miguel P. Shelley, who for the last 23 years has been associated with the crude rubber industry in Pará. His career in South America, both in the gathering and exportation of rubber and in other industries, has been varied and is most interesting. It is a good illustration of the influence of early reading upon one's future.

The books of adventure of Jules Verne and Captain Mayne Reid inspired him as a boy with the desire of seeing Brazil, and especially of visiting the Amazon Valley with its wild natural life. The opportunity for gratifying this desire arrived early in life, when as he was about to be admitted to a commercial college in

Berlin the advertisement of one Dr. Prado, a Brazilian, appeared in a local paper, for a young man who spoke English, German, French and Russian, to take charge of a colonizing party for a coffee plantation at São Paulo. He applied for and secured the position.

After a year's work on the plantation his services were no longer needed, because the laborers had learned to do the necessary work without the aid of an interpreter. During this time he



MIGUEL P. SHELLEY.

learned Portuguese, Spanish and a little Italian. His next employment was at São Paulo on the staff of the German newspaper "Neue Freie Presse," and later he became traveling sales man for the paper and its accessory printing establishment.

In 1891, when a revolution broke out in Brazil, he traveled north to Pará. There he was engaged by a general brokerage and auctioneering establishment, where he worked for 5 years. But knowing that the principal business of Pará was rubber, he determined to make this article the subject of special study. The chance came when Chavez Hermanos, the largest owners of rubber estates in Rio Madeira, requiring a general clerk for their different *seringals*, he obtained this position, learning there the rudiments of the rubber industry. For a few months, in order to learn the work practically, he worked as a laborer, starting with location of trees, or forming an *estrada*, tapping them and fuming the latex. Later he became manager of the business in Pará where they were established as *aviadores*, supplying mostly their own needs.

In 1899, during the financial crisis in Brazil, the firm had to close up its business at Pará. Mr. Shelley then came to the United States, commissioned by the mayor of Pará, Senador Lemos, to buy beef for the State so that it could establish an opposition to the meat merchants who had been raising the price abnormally. His undertaking being successful, after a few shipments the merchants lowered the price and he returned to Pará. There Senador Lemos needed a manager for his newly organized political paper "O Jornal" and Mr. Shelley was appointed to this position. The paper was such a success that it showed a fine profit after a year's business without financially depending on the party. During this time he studied law and was graduated by the "Instituto Civico Juridico Paes de Carvalho."

In 1909 he visited New York again and during his stay contributed several articles to THE INDIA RUBBER WORLD. The following year he returned to Pará and established a commercial paper for North Brazil to specially treat of rubber, "O Comercio Norte-Brazileiro." This paper gained wide popularity, because of the great space it gave to carefully tabulated statistics and to commerce and because it foretold a year and a half in advance the drop in price of rubber to one dollar from three. It also foretold that the production of rubber in Ceylon would be 75,000 tons for 1915, and the price 50 cents and prophesied the effect of this competition on the Brazilian trade.

After a year's hard work and fighting the paper had to be dropped because of Mr. Shelley's friendly connection with Senador Lemos and the political uprising against him. He was then called by the well-known rubber expert, J. A. Mendes, to co-operate with him in re-establishing the firm of J. Marques, which had been affected by cornering the 3,000 tons of rubber on account of the Banco do Brazil (known as the Syndicate J. Marques). The greatest part of the stock was sold at good prices and the firm of J. Marques, from one of small importance, became the second in the Amazon.

When Secretary of State Elihu Root visited Pará the report which Mr. Shelley published and telegraphed to the Brazilian newspapers on his interview, showing the friendly feelings which America wished to maintain with Brazil, resulted in his receiving a most hearty welcome at Rio de Janeiro.

BRAZILIAN IMPORTS OF ELECTRICAL CABLE.

Statistics recently issued by the Merchants' Association of New York give the amount of electrical cable imported into Brazil during 1913 as having a value of considerably over \$800,000. The countries from which these imports were made and the value of the electrical cable from each country are shown in the table below, from which it will be noticed that the United Kingdom sent Brazil two and a half times as much cable as the United States.

From	Electrical Cable
United States	\$162,317
United Kingdom	408,002
Germany	166,578
France .....	.....
Other countries	85,973
Total	\$822,870

COMPARATIVE FIGURES ON EXPORTS FROM BRAZIL.

The following table shows the quantity of rubber exported from Brazil in August and September of the present year and in the same months of 1913.

	Pounds	Value
August, 1914	3,333,095	\$1,627,384
August, 1913	4,791,952	2,712,451
September, 1914	5,716,856	2,720,910
September, 1913	4,899,600	2,762,462

COTTON PLANTING IN SOUTH AMERICA.

A new company under the name of the Dutch West Indies Cotton Growing Co. has been established in Holland for the object of raising cotton on the island of St. Eustatius, Dutch Windward Islands.

Previous to the declaration of war, a company (styled "La Oriental") was formed in Brussels for the establishment in the Department of the Rio Negro, Uruguay, of a cotton planting colony, in connection with a thread and textile factory.

Should be on every rubber man's desk—Crude Rubber and Compounding Ingredients; Rubber Country of the Amazon; Rubber Trade Directory of the World.

NOTES FROM BRITISH GUIANA.

By Our Regular Correspondent.

THE WAR AND THE BALATA INDUSTRY: HARD HIT.

THE balata season is now practically at an end. The laborers are returning from the hinterland for the Christmas holiday and bleeding operations have been suspended. The season has, on the whole, been a fairly good one, from a producing point of view, but from a selling point would have been more successful had not the war broken out and upset the market. Producers are now overcoming their anxiety with regard to exporting, and during the past two months fairly heavy shipments have been made. The government not having seen its way clear to provide a guaranty scheme against losses, producers have resolved to pay war risks on exports. With hundreds of laborers coming down from the grants to receive their earnings for the season, companies have had to convert their balata into cash. The margin of profit being small, the market unsettled and the cost of production increased by the necessary payment of war risks, the season, from which so much was expected, will probably prove not to have been so very profitable. This is doubly unfortunate, for after several years of drought the present season, during which weather conditions have been more favorable, was looked to to recoup the losses that producers have sustained during recent years. The result is that the balata industry still lacks that element of stability which would cause it to be regarded as one of the colony's industrial props. It has during the past five or six years passed through a very trying period. The rubber boom, with its inflated prices and the consequent exorbitant demands by labor, did it no good service, and the years of drought that followed aggravated the mischief. Now, when the opportunity for recovery presented itself, war has broken out and demoralized the market.

The war will have another depressing effect, namely, that it postpones for an indefinite period the hinterland railway project, the improvement of hinterland communications being a very important factor in the successful prosecution of the industry. Nevertheless, these things act only as a setback. Speaking at the quarterly meeting of the Chamber of Commerce the other day, the president, A. P. Sherlock, dealing with the effect of the war upon the industrial situation, said that the council had approached the government asking that assistance be given the gold, diamond and balata industries by advancing money to enable them to be carried on as formerly. That was at the time when it was difficult to make the usual financial arrangements. The government did not consider the situation sufficiently critical and, as regards the gold industry, he believed that there was no difficulty in that, although the diamond and balata industries were suffering severely at the moment. The balata industry, he was sorry to say, had been seriously affected by the war, but he could not help thinking that this condition was only temporary, because there must be an enormous waste, to make up for which a corresponding demand for balata must soon arise.

The balata export to September 23 was 883,392 pounds, as compared with 829,157 pounds to the same period last year. These figures may be expected to show an improvement before the end of the year, but there is reason to believe that if the war had not caused nervousness the exports this year would have reached record figures.

TAPPING EXPERIMENTS—SATISFACTORY RESULTS.

At a meeting of the Board of Agriculture, held recently, Professor J. B. Harrison, Director of Science and Agriculture, supplied figures in connection with the results of recent experiments. He announced that from November, 1913, to July, 1914, 983 pounds of wet Pará rubber had been obtained

at the North Western station from 279 trees. This was equivalent to about 700 pounds dry rubber, giving a return of over 2 pounds per tree, being a very satisfactory yield for rubber trees tapped for the first time. He also reported that the rubber trees the Board had planted at Christianburg, on the Demerara river, had made very good progress during the last two years. At one time it appeared that the experiments would be a failure, but they now promised to be a success. These trees were 4½ to 5½ years old, and he would like the consent of the Board to tap them for experimental purposes. It was decided that these trees should be tapped. The agricultural expert of the "Daily Chronicle," commenting upon these returns, says: "It is gratifying to note that the results of the tapping of the *Hevea Brasiliensis* trees growing on the experimental fields at the North Western station were particularly encouraging. A return of 700 pounds of rubber from 279 trees at the first tapping is a distinct success and bears out the contention which has been expressed in these notes for the last ten years and more, that there is every reason to believe that rubber can be grown successfully in British Guiana. Had the Board of Agriculture been more active we should have known this in time to have shared in the great rubber boom. However, better late than never."

PANAMA RUBBER EXPORTS.

Exports of crude rubber from the Republic of Panama to the United States for 1912 represented \$46,600 and for 1913, \$19,016. The bulk of the shipments was from the consular district of Panama City, from which the rubber exports for the two years named amounted to \$43,800 and \$17,313.

Balata, shown separately, figures as \$20,592 and \$108,920 for the years 1912 and 1913.

HONDURAS RUBBER EXPORTS.

The rubber exports of the Republic of Honduras for the fiscal year ended July 31, 1913, represented \$35,630, of which amount shipments to the United States were \$33,797. This amount was less than one half that of the preceding annual period.

GUATEMALAN RUBBER EXPORTS.

Guatemalan exports of rubber amounted in 1913 to 200,006 pounds, value \$100,323. Of this sum the United States' share was \$39,960, or about half that of 1912.

ECUADOR'S RUBBER SHIPMENTS.

The value of Ecuador's rubber shipments is shown as follows by Consul General Frederic W. Goding, of Guayaquil:

	Pounds	Value
1912 .....	.....	\$698,965
1913	427,732	178,754

NICARAGUA'S RUBBER EXPORTS TO UNITED STATES.

Consul Harold D. Clum, of Corinto, reports exports of rubber from that point as follows: 1911, \$320,335; 1912, \$182,272; 1913, \$100,523. From the San Juan del Sur district they were: 1912, \$119,919; 1913, \$112,056.

The above-named points combined deal with 86 per cent. of the total exports.

Total exports of rubber from Nicaragua to the United States represented a value in September last of \$14,864, against similar exports for September, 1913, of \$2,936. During August, \$12,693 worth of rubber was exported from Nicaragua to this country, against \$4,016 worth in the preceding August.

EXPORTS OF BALATA FROM VENEZUELA.

Exports of balata from Venezuela to the United States for the months of August and September, 1913 and 1914, are reported by the American Minister at Caracas as follows:

	Pounds	Value
August, 1914	1,188,000	\$44,001
August, 1913	2,354,000	95,722
September, 1914	1,936,000	53,268
September, 1913	132,000	5,211

Recent Patents Relating to Rubber.

UNITED STATES OF AMERICA.

ISSUED OCTOBER 6, 1914.

- 1,111,568. Vehicle wheel rim. F. L. Sessions, Lakewood, assignor to The Standard Welding Co., Cleveland—both in Ohio.
 1,111,596. Means for tire inflation. L. Baugerat, Jr., Orléans, Ill.
 1,112,603. Vehicle wheel rim. C. W. Gressler, assignor to The Standard Welding Co., both of Cleveland, Ohio.
 1,112,615. Air containing body for an aircraft. E. D. Hollidge, Washington, D. C.
 1,112,635. Resilient heel. V. May, Chicago, Ill.
 1,112,718. Spring wheel. J. O. Nelson, Ashtabula, Ohio.
 1,112,749. Rubber heel. F. S. Abbott, Malden, Mass.
 1,112,772. Composition containing annealed steel wool and rubber. J. P. Grier, Chicago, Ill.
 1,112,865. Portable buffer. W. C. Stevens, assignor to The Firestone Tire & Rubber Co., both of Akron, Ohio.
 1,112,881. Life preserver and trunk. N. G. Abbate, Baltimore, Md.
 1,112,931. Resilient wheel. B. R. Pihlbor, Dothan, Ala.
 1,112,932. Cushion heel for foot gear. J. Preizer, Monaca, Pa.
 1,112,938. Process for the improvement of inferior grade rubbers. D. Spence and W. J. Russell, Akron, Ohio, assignors to The B. F. Goodrich Co., New York, N. Y.
 1,112,942. Cushion heel. E. Stoller, Kittanning, Pa.
 1,113,009. Sectional core for hollow rubber articles. T. Howard and G. B. Clegg—both of Providence, R. I.
 1,113,020. Writer's arm rest. S. J. King, Belton, S. C.
 1,113,036. Tire. H. E. Mitchell, Coon Rapids, Iowa.
 1,113,069. Atomizer. S. Lerski, San Francisco, Cal.
 1,113,074. Late saving suit. C. B. Voeppel, Mansfield, Mass.
 1,113,083. Pessary. M. B. Arnold, McAlester, Okla.

Design.

- 46,516. Tire. J. E. Lee, Conshohocken, Pa.

Trade Marks.

- 75,897. The Goodyear Tire & Rubber Co., Akron, Ohio. The word *Goodyear*. For belting.
 75,995. The Goodyear Tire & Rubber Co., Akron, Ohio. The words *Red Wing*. For rubber packing for machinery.
 80,072. The Striking Gum Co., Inc., New York, N. Y. The words *Golf Ball*. For chewing gum.

ISSUED OCTOBER 13, 1914.

- 1,113,266. Boat ventilator. R. W. Chert, Dresden, Germany, assignor to Sonne Rubber Inner Heel Co., New York, N. Y.
 1,113,386. Wheel and tire therefor. H. Kitcher, Toronto, Ontario, Canada.
 1,113,446. Shoe for ladders. C. D. Kline and E. Nall, assignors to The Goodyear Tire & Rubber Co., both of Akron, Ohio.
 1,113,447. Wrapping machine. C. Kuentzel, assignor to The Goodyear Tire & Rubber Co., both of Akron, Ohio.
 1,113,513. Machine for covering bead cores. W. C. Tyler and E. Nall, assignors to The Goodyear Tire & Rubber Co.—all of Akron, Ohio.
 1,113,614. Colored caoutchouc substances and process of making same. K. Gottlieb, assignor to Farbenfabriken, vorm. Friedr. Bayer & Co.—both of Elberfeld, Germany.
 1,113,630. Process for the production of caoutchouc substances. F. Hoffmann and C. Contelle, assignors to Farbenfabriken, vorm. Friedr. Bayer & Co., all of Elberfeld, Germany.
 1,113,631. Production of caoutchouc substances. F. Hoffmann and C. Contelle, assignors to Farbenfabriken, vorm. Friedr. Bayer & Co., all of Elberfeld, Germany.
 1,113,645. Cushion heel. E. Jones, Indianapolis, Ind.
 1,113,695. Renewable rubber heel device. W. M. Sanford, Hartford, Conn.
 1,113,759. Colored caoutchouc substances and process of making same. R. Dittmar, Graz, Austria-Hungary, assignor to Farbenfabriken, vorm. Friedr. Bayer & Co., Elberfeld, Germany.
 1,113,831. Upper for tennis shoes. C. H. Roper, Belmont, assignor to Heel Rubber Co., Watertown—both in Mass.
 1,113,843. Foot and shampoo comb. Gertrude Smith, Valdosta, Ga.
 1,113,912. Cap for resilient wheel tires. F. V. Roesel and C. H. Franks—both of Akron, Ohio.
 1,113,925. Pneumatic tire mold. G. E. Batcheller, Mount Vernon, N. Y.
 1,113,934. Tread for resilient tires. E. F. Edgecomb, Cuyahoga Falls, Ohio.

Designs.

- 46,537. Vehicle tire. W. D. Morris, assignor to The Republic Rubber Co.—both of Youngstown, Ohio.
 46,538. Vehicle tire. W. D. Morris, assignor to The Republic Rubber Co.—both of Youngstown, Ohio.

Trade Marks.

- 78,589. Puncture Seal Manufacturing Co., Dayton, Ohio. The word *Zimco*. A puncture proofing substance for the inner tube of a pneumatic tire.

- 78,598. The Toronto Rubber Co., Toronto, Ohio. The word *Acoute*. For heat pads.
 79,001. The St. Joseph Paper Co., St. Joseph, Mo. The word *Wallow*. For floor covers.
 79,400. J. G. Stearns, Chicago, Ill. An illustration of a shovel with the words *Cliff Road*. For rubber boots and shoes.
 80,000. The Republic Rubber Co., Youngstown, Ohio. The word *Striggard*. For elastic tires.

ISSUED OCTOBER 20, 1914.

- 1,114,052. Fountain pen. W. A. Sheaffer, Fort Madison, Iowa.
 1,114,161. Spring wheel. W. L. Mann, St. Joseph, Mo.
 1,114,236. Tire vulcanizing mold. M. A. Dees and N. L. McLeod, assignors to American Tire Co., St. Louis, Mo.
 1,114,276. Resilient wheel. J. B. Lynch, Syracuse, N. Y.
 1,114,280. Mold for pneumatic tires. N. W. McLeod, St. Louis, Mo., and M. A. Dees, Pascagoula, Miss., assignors to American Tire Co., St. Louis, Mo.
 1,114,302. Cushion heel. S. D. Smith, East Dedham, assignor to J. C. Kennedy, Boston—both in Mass.
 1,114,306. Solid rubber tire. J. G. Stidder, Harrow, England.
 1,114,353. Sliding shoe for furniture. W. T. Hight, Boston, and G. W. Hight, Jr., Quincy—both of Mass.
 1,114,443. Tire casing. W. Bryant and J. J. McCann—both of Winnipeg, Manitoba, Canada.
 1,114,556. Tire sleeve. F. Aitah, Healdsburg, Cal.
 1,114,561. Syringe. A. E. Wible, New York, N. Y.
 1,114,600. Resilient tire. J. Gaynor, New York, N. Y.
 1,114,685. Pneumatic heel for boots and shoes. G. T. T. Freeman, Southsea, England.

Design.

- 46,508. Sole for footwear. W. R. Hopwood, assignor to The Beacon Falls Rubber Shoe Co.—both of Beacon Falls, Conn.

Trade Marks.

- 63,462. Hood Rubber Co., Boston, Mass. A black circle with the words *Bulls Eye*. For rubber boots and shoes.
 77,863. Herman Moritz & Escalator Shrinking Co., Inc., New York, N. Y. An oblong with the word *Knorain* in some. For rain-coats.
 78,660. Rogers Peet Co., New York, N. Y. The word *Gymkhana*. For baseball, basket ball, tennis balls, exercisers, etc.
 80,015. Protectair Manufacturing Co., Wilmington, Del., and Philadelphia, Pa. Representation of a wheel and pneumatic tire with the word *Protectair* on the tire. A liquid for the sealing of punctures in pneumatic tubes.
 80,313. American Lead Pencil Co., New York, N. Y. The word *Velvet*. For rubber erasers.
 80,366. Millwall Rubber Co., Ltd., London, England. The word *Pax*. For rubber heels and soles.
 80,548. Plymouth Rubber Co., Canton, Mass. A knot with the word *Slipknot* underneath it. For rubber heels for boots and shoes.
 81,114. The Worthington Ball Co., Elyria, Ohio. The word *King*. For golf balls.
 81,115. The Worthington Ball Co., Elyria, Ohio. The words *Queen Bee*. For golf balls.
 81,116. The Worthington Ball Co., Elyria, Ohio. The initial *A* within quotation marks. For golf balls.
 81,117. The Worthington Ball Co., Elyria, Ohio. The word *Ring*. For golf balls.
 81,118. The Worthington Ball Co., Elyria, Ohio. The word *Jack*. For golf balls.

ISSUED OCTOBER 27, 1914.

- 1,114,732. Machine for making tire casings. F. B. Converse and F. A. Kress, both of Akron, Ohio, assignors to The B. F. Goodrich Co., New York, N. Y.
 1,114,739. Life preserver. M. Dobuch, Nanty Glo, Pa.
 1,114,819. Shoe bottom filler and method of making. A. Thoma, Cambridge, Mass., assignor to North American Chemical Co., New York, N. Y.
 1,114,841. Composition for and process of revivifying and preserving rubber. A. A. Wright, Oakland, assignor to The Resilia Corporation, San Francisco—both in California.
 1,114,863. Eraser. R. A. Costello, Chicago Heights, Ill.
 1,114,930. Spring wheel. F. Stitzel, Louisville, Ky.
 1,114,965. Demountable rim. J. C. Cole, assignor to Fisk Rubber Co.—both of Chicopee Falls, Mass.
 1,115,015. Tire. W. J. Peterson, Brooklyn, N. Y.
 1,115,031. Process for treating rubber. G. Standon, Muskegon, Mich.
 1,115,082. Cushioned pneumatic tire. J. A. Menner, Paris, France.
 1,115,094. Life preserver. M. Nowacki, Camden, N. J.
 1,115,102. Time stamp. G. E. Perry, Chicago, Ill.
 1,115,107. Vaginal syringe. C. O. Rice, Denver, Colo.
 1,115,224. Syringe. C. D. McAllum, De Kalb, Miss.

- 1,115,240. Method of manufacturing resilient articles. L. T. Petersen, Youngstown, Ohio.
 1,115,409. Method of constructing pneumatic tires. F. S. Dickinson, New York, N. Y.
 1,115,430. Pneumatic tire. O. K. Hoppes, Tamaqua, Pa.

Designs.

- 46,592. Rubber brush. O. Lick, St. Louis, Mo.
 46,593. Rubber brush. O. Lick, St. Louis, Mo.
 46,594. Rubber brush. O. Lick, St. Louis, Mo.
 46,595. Rubber brush. O. Lick, St. Louis, Mo.
 46,596. Rubber brush. O. Eick, St. Louis, Mo.
 46,603. Rubber balloon cap. J. A. Murray, assignor to The Seamless Rubber Co., both of New Haven, Conn.

Trade Marks.

- 71,335. The Falls Rubber Co., Cuyahoga Falls, Ohio. A shield with a water fall scene. For inner tubes for tires, and tire casings.
 72,431. Braender Rubber & Tire Co., Rutherford, N. J. Representation of the heel of a bulldog with a shield clamped between its jaws with the word *Braender*. For inner tubes.
 75,990. The Goodyear Tire & Rubber Co., Akron, Ohio. The word *Kling-ree*. For rubber belting.
 78,842. The Marathon Tire & Rubber Co., Cuyahoga Falls, Ohio. The word *Marathon*. For rubber tires, casings and tubes.
 80,210. Revere Rubber Co., Providence, R. I., and Chelsea, Mass. The word *Spring step*. For rubber horseshoes.
 80,426. Hudson & Thibber Co., Minneapolis, Minn. The word *Modoc*. For rubber belting, rubber hose, etc.
 80,596. Wm. Winkley, Jr., Co., Chicago, Ill. The word *Triplemint*. For chewing gum.
 80,737. The B & R Rubber Co., Brookfield and North Brookfield, Mass. The word *Librax*. For rubber soles and heels.
 81,070. Northern Shoe Co., Duluth, Minn. The word *Rebust*. For rubber and other shoes.
 81,495. W. B. Price, Poughkeepsie, N. Y. The word *Repelite*. For composition for waterproofing fabrics.
 81,496. W. B. Price, Poughkeepsie, N. Y. The word *Opacite*. For waterproofing composition for fabrics.
 81,497. W. B. Price, Poughkeepsie, N. Y. The word *Emla*. For waterproofing composition for fabrics.
 81,498. W. B. Price, Poughkeepsie, N. Y. The word *Densid*. For waterproofing composition for fabrics.

[NOTE. Printed copies of specifications of United States patents may be obtained from THE INDIA RUBBER WORLD office at 10 cents each, post-paid.]

GREAT BRITAIN AND IRELAND. PATENT SPECIFICATIONS PUBLISHED.

The number given is that assigned to the Patent at the filing of the application, which in the case of these listed below was in 1913.
(Prior to Patents of American Inventions.)

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, OCTOBER 7, 1914.]

- 13,480 (1913). Specific gravimetric estimating apparatus comprising ebullite tube. D. P. Battery Co. and T. C. Elliott both of Lamford Mills, Bakewell, Derbyshire.
 13,542 (1913). Rubber brush for vacuum cleaning apparatus. L. N. Reddy, Bank Chambers, Southampton Buildings, London.
 13,617 (1913). Covers and protectors for hats. I. Matzen, 35, Hermannstrasse, Alt-Rahlstedt, Schleswig-Holstein, Germany.
 13,624 (1913). Wheel tire. C. H. Clinton, 37, Westfield Road, Salford, Surrey.
 13,628 (1913). Blowpipe and ball. C. P. Elieson, 24, St. Mary Abbott's Terrace, Kensington, London.
 *13,637 (1913). Remson compounds. J. P. A. McCoy, 590, Holmes street, Wilkesburg, Pa., U. S. A.
 13,685 (1913). Match stands with ring of rubber. J. V. Davis, Willoughby House, Walsall Road, Willenhall, Staffordshire.
 13,700 (1913). Reducing rubber bearing plants. S. Goldreich and J. L. Palmer, 18, Rope-maker street, London.
 13,760 (1913). Lapping rubber and like trees. J. J. Hutton, Newlands, Ridge way, near Sheffield.
 13,845 (1913). Isoprene. C. K. F. L. Gross, Bevon, Soon, Norway.
 13,846 (1913). Synthetic caoutchouc. C. K. F. L. Gross, Bevon, Soon, Norway.
 *13,943 (1913). Detachable protector for the soles and heels of boots. G. F. Matzner, 54 South Ninth street, Minneapolis, Minn., U. S. A.
 13,948 (1913). Solid tire. C. S. Stone, 8, Cowdrey Road, South Wimbledon, London.
 14,007 (1913). Tire ring rubber bearing plants. J. L. Palmer, 18, Rope-maker street, London.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, OCTOBER 14, 1914.]

- 14,081 (1913). Table game. R. Hampson, 30, Hawthorn Road, New Merton, Farnsworth, near Manchester.
 14,099 (1913). Chewing lozenges consisting of a rubber or other sponge. M. Falk, 85, Moltkestrasse, Köln, Germany.
 *14,117 (1913). Elastic cords, garters, belts, etc. M. W. Schloss, 291 South avenue, New York, U. S. A.
 14,138 (1913). Coated rubber surfaces for washing clothes. R. Hogg, 2, Clepston Avenue, Liscard, Cheshire.

- *14,244 (1913). Heel band of end lasting mechanism comprising a band of balata. M. Brock, 15 Woodville street, Roxbury, Mass., U. S. A.
 14,251 (1913). Wheel for elastic or pneumatic tire. R. Kronenberg, Ohligs, Rhine Province, Germany.
 14,281 (1913). Spring wheel with continuous outer ring and pneumatic rubber ring and like cushions. F. Hayes, 3, Beech Road, Woodhey, Rock Ferry, Cheshire.
 14,332 (1913). Floats for hydro-aeroplanes comprising upper and lower members held apart by resilient means formed of india rubber. H. Farman, 167, Rue de Silly, Billancourt, Seine, France.
 *14,363 (1913). Spring wheel. J. H. W. Kepler, Rural Route No. 1, West Alexandria, Ohio, U. S. A.
 14,403 (1913). Tire attachment to rims. T. Dunn, 27, Louisville Road, Upper Tooting, London.
 14,481 (1913). Phenol formaldehyde resins. H. Stockhausen, 25, Bakerpfad, Crefeld, and R. Guhl, 2, Kaiser Friedrichstrasse, Charlottenburg, near Berlin both in Germany.
 14,517 (1913). Rubber impregnated packing. G. H. Cook, Lion Works, Gifford street, Poplar, London.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, OCTOBER 21, 1914.]

- 14,621 (1913). Trousers provided with an elastic gusset on each side of the waist. A. Woodbine, 16, North street, Wellingborough.
 14,724 (1913). Feeding bottles. R. S. Dowell, Globe Works, Chatsworth Road, Clapton Park, London.
 14,744 (1913). Spring wheel with continuous outer rigid ring and pneumatic cushions. T. Unsworth, 34, Park street, St. Kilda, Victoria, Australia.
 14,789 (1913). Road paving blocks with rubber faces. A. S. Morrison, 37, Northgate, Regent's Park, London.
 14,801 (1913). Vapour bath having a covering of waterproof fabric. I. Gyenes, Kaposvar, Hungary.
 14,897 (1913). Fountain pens. C. Pickett, "Fernleigh," Town Green, near Ormskirk, Lancashire, and E. E. E. Emmerson, 26, Kirkland avenue, Higher Trannmere, Cheshire.
 15,066 (1913). Cloaks of waterproof material. R. Meyer, Bot. 24, Barcelona, Spain.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, OCTOBER 28, 1914.]

- 15,112 (1913). Game comprising rubber table pads. R. W. Buckby, 2, Gladstone street, Leicester.
 15,139 (1913). Apparatus with bulb for treating diseases with radiations, etc. O. Samuely, 105, Dalmatstrasse, Charlottenburg, Germany.
 15,185 (1913). Dress shields. W. R. Weeks, 1, Ramilies street, Great Marlborough street, London.
 15,213 (1913). Teat cup for cow milkers. R. Kennedy, 3, Spungskell avenue, Pollok-shields, Glasgow.
 15,249 (1913). Self sealing air tube for wheel tires. F. C. R. Marks, 57, Lincoln's Inn Fields, London.
 15,447 (1913). Toothbrush holders. R. M. Withycombe, 283, Elizabeth street, Sydney, Australia.

THE FRENCH REPUBLIC.

PATENTS ISSUED (with Dates of Application).

- 470,499 (June 16, 1913). Process of making fabrics for tire covers. E. Dranlutte.
 470,586 (April 7, 1914). Elastic tire for vehicle wheels. W. H. Carmont.
 470,647 (April 8). Hydro-pneumatic tire for vehicle wheels. A. F. Grenneillon.
 470,653 (April 8). Rubber syringe in one piece, and its process of manufacture. J. Lick & Co.
 470,717 (April 9). Pneumatic heel for footwear. G. Freeman.
 470,745 (April 10). Perfected movable elastic heel and its system of attachment. E. A. Nolan.
 470,833 (June 24, 1913). Process for vulcanization of rubber. J. Bastide.
 470,879 (March 2, 1914). Improvements in processes and appliances for mulling rubber articles. F. T. Roberts and R. H. Rosenfeld.
 470,885 (March 10). System of rim for pneumatic wheels. J. E. Serste.
 470,961 (April 10). Improvements in tires for vehicle wheels. W. E. Muntz.
 471,002 (April 16). Mudguard for automobiles and other vehicles. A. C. Adams.
 471,010 (April 16). Improvements in tires for vehicle wheels. M. Perot and J. E. Daubré.
 471,175 (April 21). Elastic tire principally intended for heavy automobiles and trucks. A. Borson and A. Preuss.
 471,201 (July 3, 1913). Improvement in detachable rim. A. L. F. Prat.
 471,231 (April 2, 1914). Improvements in appliances for treating latex. H. A. Wickham.
 471,344 (April 25). Antiskid for automobile wheels. M. Malik.
 471,403 (April 27). Machine for manufacture of gummy compounds. F. Kempter.
 471,415 (April 27). Mudguard for automobiles. Quévrain and Desmedt.
 471,457 (April 28). Improvements in pneumatic tires. H. A. Lepetit.
 471,518 (April 30). Improvements in elastic tires for automobiles and other vehicles. H. Diamant.
 471,625 (February 21). Shock absorber adaptable as a flexible wheel tire. O. J. Hobson.
 471,732 (April 30). New type of tire for road vehicles. W. C. Sneyd and R. Billington.

THE GERMAN EMPIRE.

PATENTS ISSUED (with Dates of Validity).

- 279,271, Class 30b (February 1, 1911). Apparatus for making rubber objects. Elizabeth Lambert, Eisenbahnstrasse, 40, Berlin-Wilmersdorf.
- 279,370, Class 71a (January 31, 1914). Rubber tire treads with applied leather portions. Minna and Agatha Reich, Schillerstrasse, 2, Northheim.
- 279,483, Class 63c (November 23, 1913). Acoustic indication of air escaping from pneumatic tires. Haghart Sylvester Christopherson, Odense, Denmark.
- 279,484, Class 63c (November 30, 1912). Pneumatic wheel tires or hose. Eduard Breuer, Pilsen.
- 279,666, Class 63c (January 17, 1914). Pneumatic tires, in which the air tube has a thickened portion, which automatically closes punctures. Carl Leichmann, vor dem Harttor, 13, Geldern.
- 279,644, Class 30d (December 5, 1913). Adjustable truss, with spherical continuation. Karl Willig, Suhl, Thüringen.
- 279,649, Class 39a (November 16, 1913). Mixing machine, specially for rubber. Fritz Kempter, Heinestrasse, 10, Stuttgart.
- 279,735, Class 30d (March 13, 1914). Appliance for prevention and cure of flat feet. Emil Huber, Karschlautern.
- 279,780, Class 39b (January 10, 1913). Process for improving synthetic products resembling rubber. Badische Anilin- und Soda Fabrik, Ludwigshafen.
- 279,801, Class 63c (January 9, 1914). Rubber tires with hollow chambers arranged one above another. Albert Witzel, Ludwigshurg.
- 279,835, Class 39b (January 28, 1913). Process for manufacture of products resembling vulcanized rubber. Badische Anilin- und Soda Fabrik, Ludwigshafen.
- 279,980, Class 63c (February 15, 1913). Process of manufacture of tires from discs arranged radially with respect to a ring. Divine Tire Co., Utica, N. Y.
- 280,025, Class 63c (February 10, 1914). Protective cover for treads of pneumatic tires. Wilhelm Dietz, Aeussere Sulzbacher Strasse, 34, Nürnberg.

RUBBER MEN ATTEND THE FIRE ENGINEERS' CONVENTION.

The convention of the International Association of Fire Engineers, held at New Orleans, Louisiana, October 20-23, was attended by many representatives of the rubber companies, who enjoy associate membership in the organization, as well as by active members. Among these representatives were the following: For the Bilateral Fire Hose Co.—Clay Bird, of Chicago; Dayton Rubber Manufacturing Co.—John A. MacMillan, of Dayton, Ohio; Eureka Fire Hose Co.—S. P. Blanck, P. O. Herbert and C. B. Payne, of Atlanta, and Thos. B. Galbraith, of New York; Fabric Fire Hose Co.—A. C. Hopper, of Dallas, Texas, and J. J. Rafter, of Atlanta; Firestone Tire & Rubber Co.—Geo. A. Talbot, of Akron; The B. F. Goodrich Co.—A. H. Leavitt, Akron; Goodyear Tire and Rubber Co.—J. E. Davies, and F. H. Sawyer, of Akron; Sewell Cushion Wheel Co.—E. H. Milliken, Boston, and H. J. Sewell, Detroit.

UNITED STATES IN THE MARKET FOR DIRIGIBLES.

Announcement has been made that the United States Government is considering the purchase of four dirigible balloons for military purposes and that it has in view arrangements to assist manufacturers of this class of equipment. Several firms have been organized in this country for the construction of dirigibles.

TESTING OF RUBBER GLOVES.

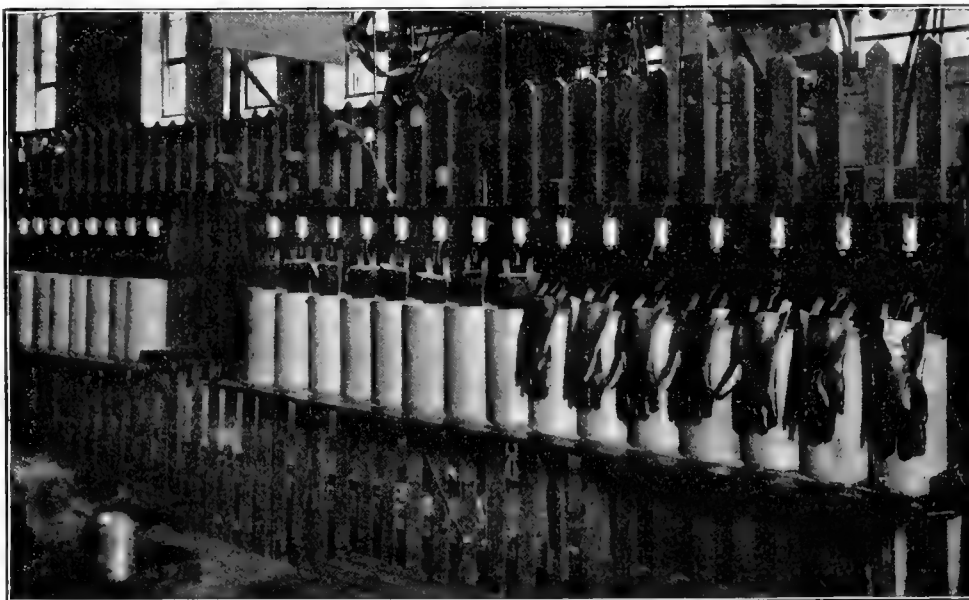
It is customary for electric light and power companies to furnish rubber gloves to those of their employees who may have occasion to work on high tension apparatus. Since it is impossible to detect by visual examination very minute defects, such as pin-holes, a high voltage test is necessary to insure that the gloves worn by the men will not break down when being used on "live" apparatus. A great many of the central station companies also test the gloves used by their men periodically so as to insure that no gloves will be in use which have been mechanically injured. Since the user depends absolutely upon the gloves for protection, it is obvious that every precaution should be taken to insure that this confidence is not misplaced.

The most usual practice in testing gloves consists in filling the gloves with water and then immersing them in a can of water. The electrodes are connected to the water in the glove and the water in the can, the electric current being applied to the electrodes and raised gradually at a uniform rate until the test voltage is applied to the glove, which varies from 3,000 to 10,000 volts, depending upon the kind and quality of glove and the service for which it is intended. The test voltages employed vary from one and one-quarter to two times the voltage of the circuit upon which the gloves are to be used. The time of application of the voltage varies from one minute to five minutes. An ammeter is connected in the test circuit and all gloves are rejected whose insulation resistance is so weak that the current flowing through the glove exceeds 10 milliamperes at 10,000 volts. It is obvious that while the

current flowing through the glove may not be sufficient to cause a puncture (a puncture is simply the result of sufficient current having flowed through the glove at a defect to produce enough heat to cause destructive defects still it may be sufficient to shock the user without producing any visible effect upon the glove. Theoretically, some current flows through the glove in any case, its value depending

simply upon the resistance of the glove. If the resistance is sufficiently high the current is infinitesimally small, while if the resistance is low the current becomes large and serious results follow. Obviously then the amount of permissible current should be limited, because a current which will produce a severe shock to the wearer of the glove may produce no material defect in the glove itself. The limit of 10 milliamperes has been established, as this is sufficient to produce a distinct shock. While this current in itself would not ordinarily injure a person, the muscular reaction resulting from the shock might cause a man to fall from a pole or ladder and thus injure him from the secondary cause.

The accompanying photograph of the testing equipment at the Electrical Testing Laboratories, New York, shows the method of suspending water-filled gloves in metal cans for test.



GLOVE TESTING EQUIPMENT OF THE ELECTRICAL TESTING LABORATORIES, NEW YORK.

THE MARKET FOR CHEMICALS AND COMPOUNDING INGREDIENTS.

THIS is not an active period for the chemicals used in rubber works, and trading is along quiet lines. The situation in regard to many materials remains complicated and is not likely to clear up until a way has been found to restore the foreign materials which have been cut off. The lead pigments are holding steady and are meeting with a fairly good outlet in the various consuming channels. Linseed oil has gained in strength. Variations in the price of seed have affected the market for oil. Zinc oxide is in good demand with other trades helping the market. The spreading of mines along the shores of Europe has made uncertain the exportation of many articles which otherwise would reach here, and among these may be mentioned chalk. The situation in chalk is reflected in the market for whiting, as makers of the latter are not anxious to sell ahead till they can get stocks of raw material from England. French chalk is not on the market. Lithopone and barytes are affected by difficulties of transportation, and foreign makes have been in limited supply since the disturbance began.

PRICES OF CHEMICALS AND COMPOUNDING INGREDIENTS.

November 30, 1914.

Aluminum flake	lb.	\$0.01	1/2
Aniline oil	lb.	.36	@
Antimony, crimson, sulphuret of	lb.	.40	@
Antimony, golden, sulphuret of	lb.	.28	@
Arsenic sulphide	lb.	.12	@
Asbestine	ton	16.00	@ 18.00
Barytes, domestic	ton	21.75	@
Bayberry wax	lb.	.24	@ .27
Beeswax, crude yellow	lb.	.30	@ .32
Benzol 90 per cent.	gal.	.30	@
Black hypo	lb.	.25	@
Blanc fixe	lb.	.037	@ .04
Cadmium, yellow	lb.	1.25	@ 1.50
Carbon bi-sulphide	lb.	.05 1/2	@ .07
Carbon gas	lb.	.04	@ .06
Carbon tetra-chloride, drums.	lb.	.14	@ .16
Ceresin wax, white	lb.	.12	@ .22
Chalk, L. B.	lb.	.04 1/2	@ .05 1/2
China clay, domestic	ton	8.00	@ 9.00
Chrome green	lb.	.22	@ .30
Coal tar naphtha	gal.	.28	@
Corn oil	lb.	.05	@
Fossil flour	ton	35.00	@
Glycerine, C. P., bulk.	lb.	.23	@ .24
Graphite	lb.	.40	@ .60
Green oxide of chromium	lb.	.35	@
Iron oxide	lb.	.02	@ .08 1/2
Infusorial earth	ton	30.00	@
Ivory, black	lb.	.08	@ .12
Lampblack	lb.	.03 3/4	@ .07
Lead, sublimed white	lb.	.07	@
Lead, white (basic carbonate)	lb.	.05	@ .05 1/4
Lead, white (basic sulphate)	lb.	.04 3/4	@ .05
Linseed oil, carload	gal.	.46	@
Litharge	lb.	.05	@ .05 1/4
Lithopone, American	lb.	.03 3/4	@ .04 1/2
Magnesia, carbonate	ton	.04 3/4	@ .05 1/2
Magnesia, calcined, p. wder	ton	30.00	@ 35.00
Naphtha, V. M. & P., deodorized.	gal.	.09	@
Naphtha, 70 deg.	gal.	.23	@
Naphtha, 76 deg.	gal.	.26	@
Orange mineral, domestic	lb.	.07 1/2	@ .08 1/4
Ozokerite, refined yellow	lb.	.25	@ .30
Paraffine wax, domestic 120 m. p.	lb.	.04 1/2	@ .04 3/4
Pumice stone, powder	lb.	.01 1/2	@ .02
Prussian blue	lb.	.46	@ .48
Rape seed oil	gal.	.75	@
Red lead	lb.	.05 1/2	@
Red oxide, domestic	lb.	.05 1/2	@ .6
Red Sn. oil	lb.	.25	@
Shellac, fine orange	lb.	.16	@ .18
Soapstone, powdered	ton	10.00	@ 12.00
Sulphur, bl. ric., in drums	lb.	.06 1/2	@
Sulphur, flowers	cwt.	2.20	@ 2.60
Talc, American	ton	15.00	@ 20.00
Ultramarine blue	lb.	.40	@ .14

Vermilion Chinese	lb.	.90	@ 1.00
Whiting, commercial	cwt.	.45	@ .55
Whiting, Paris white	cwt.	.70	@ .75
Whiting, English cliffstone	cwt.	.75	@ 1.00
Zinc oxide, American process	lb.	.05 3/8	@
Zinc oxide, French process, red seal.	lb.	.07	@
Zinc oxide, French process, green seal.	lb.	.07 1/2	@
Zinc oxide, French process, white seal.	lb.	.08	@

THE RUBBER SCRAP MARKET.

AT the opening of the month, dealers were purchasing boots and shoes at 6 1/2c. to 6 3/8c., while mills had reduced their offers from 7 1/4c. to 7c., with only limited transactions at 7 1/8c. Some dealers were holding out for 7 1/4c. Boots and shoes were, however, in quiet but steady demand, while the quantity offered was smaller than was the case in former years. Owing to the conditions of the market, the limited nature of the supply was not so apparent as would otherwise be the case. Dealers are not being offered large lots at present. At the close of the month they were finding it difficult to get supplies below 6 3/4c., although in a few instances they claim to have got in at 6.5c. to 6.6c. Consumers have been obliged to pay 7 1/4c., but the volume of business has been limited.

In auto. tires the volume of business has remained small. The price given by consumers, which at the beginning of the month was 4 3/8c., declined to 4.4c., at which figure business was done, some sales having been effected at 4 3/8c. Large dealers had been quoting 4 1/2c., without finding a response from buyers, while they have been offering from 4c. to 4.2c., according to size of lots. Reports of sales to mills at 4 1/2c. have not been confirmed. Solid tires have been quoted to dealers at 4c., while the latter have been asking consumers 4 1/2c.

In the earlier days of the month weakness characterized the market for inner tubes, 20c. having been offered by consumers for No. 1, while dealers were holding out for 21c. and 22c., they themselves paying 20c. The absence of movement had led to an accumulation in the West. At a later period of the month, the market became somewhat firmer, dealers being in a better position and getting an average of 22 1/2c. and 23c. delivered. No. 2 was held nominally at 12 to 13c.

Generally speaking, the prices of scrap in the concluding week of the month were steady and unchanged, reclaimers not exceeding their actual requirements.

RUBBER SCRAP PRICES PAID BY CONSUMERS FOR CARLOAD LOTS.

New York, November 30, 1914.

	Per Pound
Boots and shoes	7 3/8 @ 7 1/2
Trimmed arctics	5 1/4 @ 5 1/2
Auto tires	4 3/8 @ 4 5/8
Solid tires	5 @ 5 1/4
No. 1 inner tubes	21 @ 22
No. 2 inner tubes	11 1/2 @ 12 1/2
Red tubes	13 @ 13 1/2
Bicycle tires	2 3/4 @ 3
Irony tires	1 3/4 @ 2 1/4
No. 1 auto peelings	8 1/4 @ 9 1/4
Mixed auto peelings	6 3/4 @ 7
No. 1 soft white rubber	10 1/4 @
White wringer rubber	6 1/4 @ 7 1/4
No. 1 red scrap	9 1/4 @
Mixed red scrap	6 1/4 @ 7 1/4
Mixed black scrap	2 1/4 @
Rubber car springs	3 1/4 @
Horse shoe pads	2 1/4 @ 2 3/4
Matting and packing	1 1/2 @ 3 1/4
Garden hose	5 3/8 @ 3 1/4
Air brake hose	3 @ 3 3/4
Cotton fire hose	2 1/4 @

Review of the Crude Rubber Market.

THE present crude rubber market is certainly a most interesting one. It is safe to say that never before was it surrounded by so many elements of uncertainty. Will the English actually retain all the plantation rubber from British colonial ports, and if they do, what will they do with receipts of 34,000 tons, during the next six months? Can England use it? Can the Allies together use it? It is six times as much rubber as England used in the corresponding six months a year ago. Then again, will the English be able to get plantation rubber or will the Turks succeed in bottling up the Suez Canal? Will the Eastern planters continue to ship rubber to England under the risks involved or will they conclude to open a new chapter in Eastern exportations and ship their rubber direct to the United States by way of the Pacific, as some has already come?

Then again, how about the American rubber manufacturers? Will this much-heralded and often banqueted Prosperity put in an early appearance, so that home orders will call for a large supply of material, or will the American manufacturer have to look to the military needs of the Allies for export orders to counterbalance a decreased home consumption, and in that event, how much crude rubber is he going to need?

It really is rather a puzzling situation and it is not to be wondered at that manufacturers find themselves in something of a quandary and that the crude rubber importers are by no means all of one mind as to the outlook.

The New York market during the first half of the month was very steady, and it was not until the trade learned of England's absolute embargo on all British-controlled rubber that a feeling of nervousness began to appear. Fine hard Pará opened the first of November at 66c., and during the first two weeks varied from 63c. to 66c., not going beyond 67c. until the 25th. On the 27th it reached 71c. and on the 28th was quoted at 70@71c.

Plantation rubber shows a marked gain for the month. First Latex opened on the first of November at 61@62c. and had advanced by the 5th to 66c. Then, upon the destruction of the "Emden," it fell again on the 14th and 16th to 60c., from which point it rose steadily until it was quoted on the 28th at 75c., with smoked sheet at 80c.

The receipts of rubber from Pará during the month amounted to 1,200 tons, with 400 tons more now afloat for December arrival. The receipts of plantation rubber amounted to 2,583 tons. It is estimated that there is now afloat from Ceylon to London about 700 tons of plantation, in three boats, namely—the "St. Egbert," "City of Delhi" and "Kabinga"; but under the present embargo of course none of this will reach the New York market.

About 250 tons of guayule were received during November, but of Pontianak there has been no receipt since September 20. About 400 tons of Pontianak are now on their way from the East to London, part of this amount being on the "St. Egbert" and part on the "Kazendi."

Advices from Germany are to the effect that all the crude rubber in that country is now being used for tires and other military equipment. The price of Plantation has reached \$1.40@1.50 a pound.

What the market will do in December is anybody's conjecture. The answer would be easy if one only knew what the British Government had in its mind.

NEW YORK QUOTATIONS.

Following are the quotations at New York one year ago, one month ago, and November 30, the current date:

PARA.	Dec. 1, '13.	Oct. 31, '14.	Nov. 30, '14.
Islands, fine, new.....	66 @ 67	50@52	60@61
Islands, fine, old.....		52@53	62@64

Upriver, fine, new	76 @ 77	65@66	71@..
Upriver, fine, old		67 @ 68	73 @ 75
Islands, coarse, new	29 1/2 @ 30	27 @ 28	32 @ 33
Upriver, coarse, new		47 @ 48	52 @ 53
Upriver, coarse, old	48 @ 49		
Cameta		30 @ 31	33 @ 35
Cauchó, upper	37 1/2 @ 38	46 @ 47	52 @ 53
Cauchó, lower	46 @ 47	41 @ 43	50 @ 51

PLANTATION CEYLON.

Fine smoked sheet.....	65 @ 66	65@66	82@84
Fine pale crepe { near-by } { forward }	58 @ 59	60@61 61 @ 63	75 @ 76
Fine sheets and biscuits unsmoked	56 @ 57	60 @ 61	66 @ 68

CENTRALS.

Corinto		45 @ 46 1/2	46 @ 47
Esmeralda, sausage.....	40 @ 41	44 @ 45	46 @ 47
Guayaquil, strip			
Nicaragua, scrap	37 @ 39	44 @ 45	45 @ 46
Panama			
Mexican plantation, sheet....		37 @ 39	
Mexican, scrap	37 @ 38	40 @ 42	45 @ 46
Mexican, slab			
Mangabeira, sheet		40 @ 42	42 @ 44
Guayule			34 @ ..
Balata, sheet	63 @ 64	51 @ 52	52 @ 53
Balata, block	44 @ 45	43 @ 44	43 @ 44

AFRICAN.

Lopori, ball, prime.....	47 @ 48	52 @ 55	No supply
Lopori, strip, prime.....			No supply
Aruwimi	37 @ 38		No supply
Upper Congo, ball red.....	45 @ 46		No supply
Ikelemba			No supply
Sierra Leone, 1st quality....	45 @ 46		No supply
Massai, red		54 @ 58	No supply
Soudan Niggers			No supply
Cameroon, ball	33 @ 40	44 @ 45	45 @ ..
Benguela		31 @ 33	34 @ ..
Madagascar, pinky			
Accra, flake	20 @ 22	25 @ 26	28 @ ..

EAST INDIAN.

Assam		54 @ 58	
Pontianak	6 @ 6 3/4	8 @ 9	
Borneo, II. or 2nd		35 @ ..	40 @ ..

New York.

In regard to the financial situation, Albert B. Beers (broker in crude rubber and commercial paper, No. 68 William street, New York) advises as follows: "The market for Commercial paper has improved very much during November, with declining rates, which during the early part of the month were 6@6 1/2 per cent. for the best rubber names and 7@7 1/2 per cent. for those not so well known, but towards the end of the month these rates declined to about 5 1/2 @ 5 3/4 per cent. and 6@7 per cent., respectively."

NEW YORK PRICES FOR OCTOBER (New Rubber,)

	1914.	1913.	1912.
Upriver, fine	\$0.64 @ .66	\$0.73 @ .83	\$1.04 @ 1.11
Upriver, coarse .....	.43 @ .47	.47 @ .49	.81 @ .86
Islands, fine .....	.49 @ .53	.67 @ .72	.99 @ 1.06
Islands, coarse .....	.26 @ .28	.28 @ .29	.53 @ .56
Cameta .....	.29 @ .32	.36 @ .38	.56 @ .61

Plantation Rubber from the Far East.**EXPORTS OF CEYLON GROWN RUBBER.**

(From January 1, to October 18, 1913 and 1914. Compiled by the Ceylon Chamber of Commerce.)

To—	1913.	1914.
Great Britain	pounds 10,808,997	13,864,349
United States	4,883,733	7,105,957
Belgium	2,991,293	2,984,009
Australia	401,913	508,073
Japan	204,541	220,700
Germany	203,516	1,037,415
Straits Settlements	86,980	42,535
Italy	38,828	1,772
Austria	30,097	.....
France	4,482	317,912
Holland	992	.....
India	881	1,050
Russia .....	.....	105,212
Total	19,656,253	26,188,984

(Same period 1912, 10,058,285; same period 1911, 4,487,261.)

The export figures of rubber given in the above table include the imports re-exported. (These amount to 3,037,159 pounds—2,452,851 pounds from the Straits and 572,684 pounds from India.) To arrive at the approximate quantity of Ceylon rubber exported to date deduct the quantity of imports shown in the import table from the total exports.

TOTAL EXPORTS FROM MALAYA.

(From January to dates named. Reported by Barlow & Co., Singapore. These figures include the production of the Federated Malay States, but not of Ceylon.)

To	Singapore, Oct. 10.	Malacca, Sept. 30.	Penang, Aug. 31.	Port Swettenham, Sept. 30.	Total.
Great Britain	pounds 17,076,475	3,526,413	11,871,333	18,943,782	51,368,003
Continent	1,885,051	36,873	506,666	1,816,538	4,245,128
Japan	1,007,764	.....	.....	.....	1,007,764
Ceylon	290,245	.....	736,666	1,223,674	2,250,585
United States	8,539,365	15,878	686,667	244,109	9,806,319
Australia	83,016	.....	.....	.....	83,016
Total	29,151,116	3,579,164	13,801,332	22,228,203	68,760,815
Same period 1913	19,751,635	.....	9,939,467	21,118,796	50,809,898
Same period 1912	9,998,689	.....	5,851,230	14,917,100	30,767,019
Same period 1911	4,538,628	.....	3,042,612	8,525,001	16,106,241

FEDERATED MALAY STATES RUBBER EXPORTS.

According to information received by the Malay States Information Agency, the exports of plantation rubber from the Federated Malay States for the month of September amounted to 2,903 tons as compared with 1,850 tons in the previous month and 2,000 tons in the corresponding month last year.

Appended are the comparative statistics for 1912 and 1913.

	1912.	1913.	1914.
January	1,218	2,131	2,542
February	1,212	1,757	2,364
March	1,379	1,737	2,418
April	1,020	1,626	2,151
May	1,007	1,225	2,069
June	1,029	2,005	2,306
July	1,204	1,781	2,971
August	1,633	2,363	1,850
September	1,326	2,000	2,903
Total	11,028	16,925	21,574

STRAITS SETTLEMENTS RUBBER EXPORTS.

A cable received by the Malay States Information Agency from the Colonial Secretary, Singapore, states that the export of plantation rubber during the month of September amounted to 1,602 tons as compared with 1,325 tons in the previous month and 1,057 tons in the corresponding month last year.

The following table gives the comparison month by month for three years:

	1912.	1913.	1914.
January	253	784	1,181
February	274	743	1,703
March	427	898	1,285
April	387	762	1,548
May	431	814	1,309
June	398	812	1,480
July	380	1,120	1,584
August	729	1,315	1,325
September	597	1,057	1,602
Total	3,876	8,305	13,017

Singapore Plantation Rubber Auctions.

The sale of September 28 comprised 85 tons, of which 55 were sold. At that of October 6 about 60 tons out of 90 changed hands, while on October 13 the proportion sold was still larger, being 72 out of 90 tons.

World's Visible Supply Brazilian Rubber.

	Para.	Caucho.
September 30, 1914.....	tons 3,490	480
Against same date, 1913.....	4,250	160

MOVEMENTS OF PLANTATION RUBBER.

	1913.	1914.
London arrivals January 1 to September 30.....	tons 23,180	30,490
London deliveries January 1 to September 30.....	21,940	30,120
London stocks, August 31.....	3,109	3,505
London arrivals, September.....	2,910	3,495
London stocks, September 30.....	6,019	7,000
London deliveries in September.....	2,755	3,435
London stocks, September 30.....	3,264	3,565

The October report of Zarges, Berringer & Co., Para, gives the total exports of india rubber and caucho from Para, Manaoas and Iquitos as 3,469,276 kilograms.

IMPORTS FROM PARA AT NEW YORK.

(The Figures Indicate Weight in Pounds.)

OCTOBER 29.—By the steamer *Denis* from Para and Manaoas:

	Fine.	Medium.	Coarse.	Caucho.	Total.
Arnold & Zeiss.....	233,500	55,400	56,400	32,400=	377,700
Meyer & Brown.....	146,000	23,300	101,900	56,200=	327,400
General Rubber Co.....	128,700	34,100	19,100	1,400=	183,300
Henderson & Korn.....	110,200	22,300	35,300	7,600=	175,400
H. A. Astlett & Co.....	31,600	22,200	36,300	6,800=	96,900
Robinson & Co.....	39,600	18,100	10,600	600=	68,900
G. Amisack & Co.....	35,800	3,900	1,200	.....	40,900
Johnstone, Whitworth & Co.....	36,100	.....	.....	.....	36,100
Aldens' Successors, Ltd.....	20,160	1,120	15,246	.....	36,526
Hagemeyer & Brunn.....	12,500	1,100	7,800	.....	21,400
Crossman & Siecken.....	9,800	1,400	1,500	900=	13,600
Rumsey & Greuter Co., Inc.....	.....	.....	1,500	.....	1,500
Total	803,960	182,926	286,846	105,900=	1,379,626

NOVEMBER 9.—By the steamer *Francis* from Para:

	Fine.	Medium.	Coarse.	Caucho.	Total.
Arnold & Zeiss.....	31,100	2,900	56,100	.....	90,100
Meyer & Brown.....	58,700	4,700	23,500	.....	86,900
Henderson & Korn.....	20,700	700	25,100	.....	46,500
H. A. Astlett & Co.....	11,800	5,000	19,100	300=	36,200
Export	101,400	.....	.....	.....	101,400
Total	223,700	13,300	123,800	300=	361,100

NOVEMBER 19.—By the steamer *Gregory* from Iquitos:

	Fine.	Medium.	Coarse.	Caucho.	Total.
Meyer & Brown.....	19,500	2,900	6,600	26,400=	55,400
H. A. Astlett & Co.....	21,500	8,100	7,400	20,900=	58,300
H. C. Kupper.....	42,800	4,700	4,900	7,600=	73,600
G. Amisack & Co.....	78,800	21,600	12,500	94,100=	207,000
Rumsey & Greuter Co., Inc.....	9,800	.....	800	2,100=	12,700
W. R. G. Co. & Co.....	20,800	.....	.....	39,700=	62,500
Johnstone, Whitworth & Co.....	34,600	2,800	8,900	15,000=	61,300
Lyndick Probert & Co.....	3,400	.....	1,700	7,900=	12,100
Col. B. of Spanish America.....	3,200	.....	1,100	3,600=	8,600
Total	235,500	35,400	45,000	235,400=	551,500

NOVEMBER 19 By the steamer *Gregory* from Para and Manaoas:

	Fine.	Medium.	Coarse.	Caucho.	Total.
Arnold & Zeiss.....	82,600	5,900	40,100	1,100=	129,700
Meyer & Brown.....	6,700	20,800	55,100	12,400=	181,000
General Rubber Co.....	69,300	9,200	2,900	.....	82,100
W. R. G. Co. & Co.....	44,000	2,000	700	.....	43,300
H. A. Astlett & Co.....	76,000	9,100	20,700	14,600=	120,500
Aldens' Successors, Ltd.....	16,800	7,100	51,653	11,111=	86,750
Henderson & Korn.....	7,900	11,900	35,100	800=	115,700
Hagemeyer & Brunn.....	.....	.....	56,700	72,200=	128,900
G. Amisack & Co.....	7,900	400	5,900	1,800=	16,000
Total	465,866	67,700	256,353	114,011=	903,950

NOVEMBER 19.—By the steamer *Sao Paulo* from Para:

	Fine.	Medium.	Coarse.	Caucho.	Total.
Arnold & Zeiss.....	76,900	10,600	54,600	.....	141,500
General Rubber Co.....	123,400	10,800	4,400	.....	138,600
Meyer & Brown.....	114,700	7,500	16,700	24,100=	163,000
Hagemeyer & Brunn.....	5,000	400	5,300	.....	10,700
Henderson & Korn.....	11,800	6,100	25,700	4,800=	48,400
H. A. Astlett & Co.....	.....	.....	7,200	.....	7,200
Aldens' Successors, Ltd.....	.....	.....	6,547	.....	6,547
G. Amisack & Co.....	16,600	1,100	5,500	.....	23,200
Total	348,400	35,600	125,947	28,900=	539,147

PARA RUBBER VIA EUROPE.

Pounds.

OCTOBER 30.—By the <i>Cedric</i> —Liverpool:	
Rubber Trading Co. (fine).....	2,200
OCTOBER 30.—By the <i>Francina</i> —Liverpool:	
Johnstone, Whitworth & Co. (fine).....	4,500
OCTOBER 31.—By the <i>Lusitania</i> —Liverpool:	
Johnstone, Whitworth & Co. (coarse)....	22,500
NOVEMBER 4.—By the <i>St. Louis</i> —Liverpool:	
W. R. Grace & Co. (fine).....	11,200
NOVEMBER 14.—By the <i>Baltic</i> —Liverpool:	
Henderson & Korn (fine).....	22,500
NOVEMBER 16.—By the <i>New York</i> —Liverpool:	
Arnold & Zeiss (fine).....	6,000
NOVEMBER 21.—By the <i>Adriatic</i> —Liverpool:	
Henderson & Korn (coarse).....	45,000
NOVEMBER 23.—By the <i>Philadelphia</i> —Liverpool:	
Henderson & Korn (coarse).....	11,200

CENTRALS.

[*This sign, in connection with imports of Centrals, denotes Guayule rubber.]

Pounds.

OCTOBER 29.—By the <i>Almirante</i> —Cartagena:	
R. Castillo.....	2,000
Caballero & Blane.....	1,500
	3,500
OCTOBER 30.—By the <i>Advance</i> —Colon:	
Piza, Nephews & Co.....	3,000
G. Amsinck & Co.....	800
Harburger & Stack.....	200
	4,000
NOVEMBER 2.—By the <i>Morro Castle</i> —Mexico:	
J. A. Medina & Co.....	1,000
NOVEMBER 2.—By the <i>Morro Castle</i> —Tampico:	
Federico Naro.....	*27,000
NOVEMBER 4.—By the <i>Panama</i> —Colon:	
G. Amsinck & Co.....	4,400
Wessels, Kulenkampff & Co.....	2,200
Camacho, Rolan & Van Sichel.....	2,800
A. M. Capen's Sons.....	1,700
Mecke & Co.....	1,500
Pablo Calvet & Co.....	900
	13,000
NOVEMBER 4.—By the <i>Antilles</i> —New Orleans:	
E. Steiger & Co.....	6,000
NOVEMBER 7.—By the <i>Monterey</i> —Mexico:	
R. Fabien & Co.....	500
Federico Naro.....	*27,000
	27,500
NOVEMBER 7.—By the <i>Manzanillo</i> —Mexico:	
Harburger & Stack.....	11,000
American Trading Co.....	10,500
H. Marquardt & Co.....	1,500
	23,000
NOVEMBER 7.—By the <i>Zacapa</i> —Colon:	
W. R. Grace & Co.....	25,000
NOVEMBER 11.—By the <i>Alhambra</i> —Colon:	
Lawrence Johnson & Co.....	10,000
Pablo, Calvet & Co.....	3,600
G. Amsinck & Co.....	600
	14,200
NOVEMBER 12.—By the <i>El Munis</i> —Galveston:	
Various.....	*25,000
NOVEMBER 13.—By the <i>Mexico</i> —Mexico:	
Madero Bros., Inc.....	*67,000
E. Steiger & Co.....	200
H. Marquardt & Co.....	200
Various.....	5,000
	72,400
NOVEMBER 13.—By the <i>Comas</i> —New Orleans:	
Various.....	3,500
NOVEMBER 14.—By the <i>Momus</i> —New Orleans:	
E. Steiger & Co.....	17,000
NOVEMBER 16.—By the <i>Siamois Prince</i> —Bahia:	
Adolph Hirsch & Co.....	35,000
NOVEMBER 16.—By the <i>Colon</i> —Colon:	
G. Amsinck & Co.....	12,200
Lawrence Johnson & Co.....	7,000
Andean Trading Co.....	1,300
Various.....	13,500
	34,000
NOVEMBER 18.—By the <i>Trent</i> —Colon:	
A. M. Capen's Sons.....	5,500
Hispano American Sales Co.....	1,500
	7,000
NOVEMBER 18.—By the <i>El Alba</i> —Galveston:	
Various.....	*40,000
NOVEMBER 21.—By the <i>Esperanza</i> —Tampico:	
Federico Naro.....	*56,000
Madero Bros., Inc.....	*67,000
	*123,000

NOVEMBER 19.—By the <i>Paris</i> —Colon:	
Pottberg, Ebeling & Co.....	1,000
H. Wolf & Co.....	200
G. Amsinck & Co.....	200
	1,700

NOVEMBER 19.—By the <i>Last</i> —Colon:	
G. Amsinck & Co.....	500
M. Rodriguez.....	95,000
Eastmond & Co.....	1,500
	1,150

NOVEMBER 23.—By the <i>Sadler</i> —Colon:	
Feggs & Heinlein.....	1,000

NOVEMBER 24.—By the <i>Carmen</i> —Port Limon:	
Isaac Brandon & Bros.....	700

NOVEMBER 24.—By the <i>Alaska</i> —Colon:	
Wessels, Kulenkampff & Co.....	1,200
Harburger & Stack.....	300
	1,500

AFRICAN.

Pounds.

OCTOBER 26.—By the <i>Minnehaha</i> —London:	
Arnold & Zeiss.....	45,000
Aldens' Successors, Ltd.....	7,307
	52,307

OCTOBER 27.—By the <i>Chicago</i> —Havre:	
Meyer & Brown.....	70,000

OCTOBER 27.—By the <i>Philadelphia</i> —London:	
Aldens' Successors, Ltd.....	22,622

OCTOBER 30.—By the <i>Franconia</i> —Liverpool:	
Arnold & Zeiss.....	11,200

OCTOBER 31.—By the <i>Lusitania</i> —Liverpool:	
Meyer & Brown.....	2,500

NOVEMBER 2.—By the <i>Minnetonka</i> —London:	
Aldens' Successors, Ltd.....	8,900

NOVEMBER 9.—By the <i>St. Paul</i> —Liverpool:	
Arnold & Zeiss.....	22,500
Various.....	2,000
	24,500

NOVEMBER 9.—By the <i>Menominee</i> —London:	
Arnold & Zeiss.....	11,200
Various.....	9,000
	20,200

NOVEMBER 13.—By the <i>Frankmore</i> —Lisbon:	
Various.....	75,000

NOVEMBER 14.—By the <i>Baltic</i> —Liverpool:	
Rubber Trading Co.....	7,000
Rubber & Guayule Agency, Inc.....	3,500
	10,500

NOVEMBER 16.—By the <i>New York</i> —Liverpool:	
Arnold & Zeiss.....	7,000

NOVEMBER 17.—By the <i>Tenacity</i> —Liverpool:	
Robinson & Co.....	4,500

NOVEMBER 21.—By the <i>Adriatic</i> —Liverpool:	
Rubber Trading Co.....	11,200

NOVEMBER 25.—By the <i>Franconia</i> —Liverpool:	
Aldens' Successors, Ltd.....	112,000
Meyer & Brown.....	9,000
	121,000

NOVEMBER 25.—By the <i>King George</i> —Lisbon:	
Ed. Maurer.....	45,000
W. Stiles.....	16,500
	61,500

EAST INDIAN.

[*Denotes plantation rubber.]

Pounds.

OCTOBER 10.—By the <i>Minnetonka</i> —London:	
Aldens' Successors, Ltd.....	*39,994

OCTOBER 26.—By the <i>Minnehaha</i> —London:	
Meyer & Brown.....	*70,000
Henderson & Korn.....	*50,000
Raw Products Co.....	*2,500
Ed. Maurer.....	*45,000
Arnold & Zeiss.....	*12,500
W. R. Grace & Co.....	*25,000
General Rubber Co.....	*150,000
Johnstone, Whitworth & Co.....	*140,000
Rumsey & Greutert Co, Inc.....	*27,500
Robinson & Co.....	*8,000
Hodgman Rubber Co.....	*2,500
Charles T. Wilson.....	*165,000
L. Littlejohn & Co.....	*72,000
Various.....	*250,000
	*1,020,000

OCTOBER 30.—By the <i>Cedric</i> —Liverpool:	
General Rubber Co.....	*225,000
Meyer & Brown.....	*6,000
Various.....	*80,000
	*311,000

OCTOBER 31.—By the <i>Lusitania</i> —Liverpool:	
Robinson & Co.....	*27,000
Johnstone, Whitworth & Co.....	*7,000
	*34,000

NOVEMBER 4.—By the <i>Minnetonka</i> —London:	
Meyer & Brown.....	*140,000
General Rubber Co.....	*355,000

Henderson & Korn.....	*175,000
L. Littlejohn & Co.....	*200,000
Robert Baderhop.....	*20,000
Ed. Maurer.....	*50,000
Charles T. Wilson.....	*70,000
Johnstone, Whitworth & Co.....	*210,000
Ed. Baderhop.....	*21,000
Rumsey & Greutert Co, Inc.....	*33,500
Aldens' Successors, Ltd.....	*73,346
Robinson & Co.....	*6,000
Various.....	*495,000
	*2,075,246

NOVEMBER 7.—By the <i>Laplant</i> —Liverpool:	
Arnold & Zeiss.....	*72,000
Various.....	*6,000
	*13,000

NOVEMBER 9.—By the <i>Menominee</i> —London:	
Henderson & Korn.....	*8,000
General Rubber Co.....	*50,000
Rumsey & Greutert Co, Inc.....	*2,500
Robert Baderhop.....	*15,000
Aldens' Successors, Ltd.....	*50,000
Various.....	*77,000
	*225,402

NOVEMBER 11.—By the <i>Rydal Hall</i> —Colombo:	
Meyer & Brown.....	*230,700
Rubber & Guayule Agency, Inc.....	*90,000
Henderson & Korn.....	*50,000
L. Littlejohn & Co.....	*30,000
Arnold & Zeiss.....	*7,000
Rumsey & Greutert Co, Inc.....	*7,000
Various.....	*85,000
	*499,700

NOVEMBER 12.—By the <i>Mantou</i> —London:	
Meyer & Brown.....	*55,000
Otto Isenstein.....	*45,000
General Rubber Co.....	*130,000
Adolph Hirsch & Co.....	*11,000
Johnstone, Whitworth & Co.....	*80,000
Arnold & Zeiss.....	*8,000
Rumsey & Greutert Co, Inc.....	*7,000
Various.....	*250,000
	*586,200

NOVEMBER 14.—By the <i>Baltic</i> —Liverpool:	
Arnold & Zeiss.....	*2,200

NOVEMBER 16.—By the <i>Indraghiri</i> —Singapore:	
Ed. Baderhop & Co.....	*22,500
W. R. Grace & Co.....	*11,200
L. Littlejohn & Co.....	*65,000
Hadden & Co.....	*45,000
Johnstone, Whitworth & Co.....	*25,000
Meyer & Brown.....	*2,200
Various.....	*210,000
	*380,900

NOVEMBER 18.—By the <i>Minnetonka</i> —London:	
General Rubber Co.....	*135,000
Charles T. Wilson & Co, Inc.....	*75,000
L. Littlejohn & Co.....	*50,000
Ed. Maurer.....	*45,000
Arnold & Zeiss.....	*25,000
Meyer & Brown.....	*5,000
Robinson & Co.....	*22,500
Earle Bros.....	*22,500
Aldens' Successors, Ltd.....	*24,454
Malayan Rubber Co.....	*11,000
Rumsey & Greutert Co, Inc.....	*1,500
Various.....	*160,000
	*547,154

NOVEMBER 21.—By the <i>Adriatic</i> —Liverpool:	
Johnstone, Whitworth & Co.....	*7,000

NOVEMBER 23.—By the <i>Philadelphia</i> —Liverpool:	
Various.....	*33,500

CUSTOM HOUSE STATISTICS.

PORT OF NEW ORLEANS—OCTOBER, 1914.		
Imports:	Pounds.	Value.
India rubber.....	5,450	\$1,095
Guayule.....	19,892	4,341
Total.....	25,342	\$5,436
PORT OF PHILADELPHIA—OCTOBER, 1914.		
Imports:		
Rubber scrap.....	60,738	\$2,844
PORT OF BOSTON—OCTOBER, 1914.		
Imports:		
India rubber.....	26,381	\$10,968
PORT OF CHINA—OCTOBER, 1914.		
Imports:		
Rubber scrap.....	59,120	\$4,081
PORT OF NAWARA FATS—OCTOBER, 1914.		
Imports:		
India rubber.....	114,630	\$70,461
PORT OF DELHI—OCTOBER, 1914.		
Imports:		
Rubber scrap.....	10,273	\$383
Exports:		
Rubber scrap.....	4,476	\$374
Rubber reclaimed.....	50,245	8,462



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INDIA RUBBER GOODS IN COMMERCE. EXPORTS FROM THE UNITED STATES.

OFFICIAL statement of values of exports of manufactures of india rubber and gutta percha for the month of September, 1914, and for the first nine months of five calendar years:

MONTHS.	Belting, Packing and Hose.	Boots and Shoes.	All Other Rubber.	TOTAL.
September, 1914.....	\$211,431	\$107,429	\$485,659	\$804,519
January-August.....	1,436,030	562,475	4,709,723	6,708,228
Nine months, 1914....	\$1,647,461	\$669,904	\$5,195,382	\$7,512,747
Nine months, 1913....	1,891,785	982,953	6,546,215	9,420,953
Nine months, 1912....	1,888,433	1,014,688	6,016,371	8,919,492
Nine months, 1911....	1,701,441	1,349,380	5,402,984	8,453,805
Nine months, 1910....	1,592,594	1,664,215	4,258,968	7,515,777

The above heading, "All Other Rubber," for the month of September, 1914, and for the first nine months of three calendar years, includes the following details relating to tires:

MONTHS.	For Automobiles.	All Other.	TOTAL.
September, 1914.....	\$266,259	\$24,029	\$290,288
January-August.....	2,290,094	329,215	2,619,309
Nine months, 1914.....	\$2,556,353	\$353,244	\$2,909,597
Nine months, 1913.....	3,244,015	429,668	3,673,683
Nine months, 1912.....	2,533,635	443,443	2,977,078

GEORGE E. PELL A RUBBER BROKER.

Early in November Mr. George E. Pell opened an office as a general rubber broker in the Produce Exchange Annex, New York. Mr. Pell ought certainly to be very familiar with crude rubber, as there are very few men in the trade who have viewed it from so many different standpoints. About 15 years ago he went to Para, and remained there and in Manaos for 5 years, being associated first with Geo. A. Alden & Co. and later with Gordon & Co. While in Manaos he was the American consular agent. About ten years ago he returned to America and became connected with the General Rubber Co. In this association he made quite an extended visit to the guayule territory of Mexico, some six years ago, and within the last year or two he has visited the great rubber plantation in Sumatra in which the United States Rubber Co. is interested. At the Rubber Exhibition held in New York in the fall of 1912 Mr. Pell acted as the official representative of the Commercial Association of Para.

Messrs. R. A. & C. H. Loewenthal, treasurer and secretary, respectively, of the U. S. Rubber Reclaiming Co., Inc., with factories at Buffalo and offices in the Forty-Second Street building, have recently made application to the Supreme Court to have the name changed to "Low," in consequence of the fact that official notification has gone forth that passports issued in any German name will hardly facilitate travel to the bearer in England, France or Russia; and as both these gentlemen have occasion to make frequent trips abroad they have decided that the change would very materially promote their convenience. In addition to the inconvenience before described the name was seldom properly spelled, so that the change from Loewenthal to Low will effect an advantage in this respect.

In accordance with its usual Thanksgiving custom, the Monati-quot Rubber Works Co., of South Braintree, Mass., presented its married employes with turkeys, while the unmarried received cigars and candy.

our products not as good as
it to be? Probably I can
how to make them right.
anyway.

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CONSULTING CHEMIST
'Phone, 823 John New York

BUYERS' DIRECTORY 73

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REGISTERED TRADE-
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THE INSIDE.



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1889

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DICHORPIS GUTTA

GUTTA-PERCHA

Edited by HENRY C. PEARSON—Offices, No. 25 West 45th Street, NEW YORK.

Vol. LI. No. 4.

JANUARY 1, 1915.

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THE INDIA RUBBER PUBLISHING CO.

No. 25 West 45th Street, New York.

CABLE ADDRESS: IRWORLD, NEW YORK.

HENRY C. PEARSON, Editor

Vol. 51.

JANUARY 1, 1915.

No. 4

SUBSCRIPTIONS: \$3.00 per year, \$1.75 for six months, postpaid, for the United States and dependencies and Mexico. To the Dominion of Canada and all other countries, \$3.50 (or equivalent funds) per year, postpaid.

ADVERTISING: Rates will be made known on application.

REMITTANCES: Should always be made by bank draft or Postoffice or Express money order on New York, payable to THE INDIA RUBBER PUBLISHING COMPANY. Remittances for foreign subscriptions should be sent by International Postal Order, payable as above.

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Entered at the New York postoffice as mail matter of the second class.

TABLE OF CONTENTS ON LAST PAGE OF READING.

THE SEASON'S COMPLIMENTS.

YOU who read this, whatever your place in the world's rubber trade, are given our Happy New Year. May 1915 bring prosperity and content. May all race prejudice vanish and wars cease. May efficiency and fair-dealing, wealth and integrity, join hands.

OUR CONTEMPORARIES

SINCE the great war's beginning scores of trade journals large and small have ceased to exist. This is particularly true in England, Germany and France. Those that remain are perforce the necessary ones. At the same time, with the unavoidable curtailment of advertising, the disintegration of subscription lists and slow collections, the burden of publishing has been greatly augmented.

The English "India Rubber Journal" is one of the few to continue to appear regularly and shows no sign of slacking in interest. Congratulations and felicitations!

The "Gummi-Zeitung" also arrives regularly, having

been interrupted for some four issues only. In subject matter and as a whole it bears no evidence of unusual conditions at home or abroad. Or, more exactly, there is one difference—no market quotations for crude rubber are appended as of yore. A letter from Editor Springer in another column gives a good idea of rubber conditions in Germany.

Our very interesting contemporary "Le Caoutchouc & la Gutta-Percha" has unfortunately been forced to suspend publication. A. D. Cillard, its able editor, writes as follows:

"All our collaborators and workers are at the firing line. Some of them have already fallen on the field of honor. We have no one any longer here. There is no business and the losses experienced by our publication, 'Le Caoutchouc & la Gutta-Percha,' are such that its existence is compromised, unless some powerful firms consent to come to its help. But we do not venture to count on this. This is our situation. It is most painful for us who have taken such pains to produce this review."

THE RUBBER EMBARGO.

THE Rubber Embargo has not been lifted. The newspapers from time to time say that it has, but they are in error. In the meantime, the American Rubber Committee have done everything possible at Washington and are in close touch with the British Committee in London. Very wisely, they have insisted on keeping the rubber embargo separate from all other embargoes, as, for example, wool, graphite, etc. They are also at work upon a form of guarantee, which it is hoped will be acceptable to the British Government. In this connection a newspaper note that is going the rounds is of special interest. It reads:

"A continuance of the rubber embargo for a protracted period will have the result of putting a large number of people out of employment. It will also raise prices to consumers of rubber goods to almost unprecedented figures, and will particularly affect every user of an automobile. If the American manufacturers are obliged to depend upon rubber from Brazil, which would seem almost inevitable if this embargo is indefinitely continued, they will be in the position of manufacturing their goods from rubber purchased at an extraordinarily high price, with the possibility that at any time Great Britain might decide under certain conditions to raise this embargo. This would immediately bring the price of crude rubber down to practically a normal figure, and leave the manufacturers with a stock of merchandise on their

hands manufactured at a high cost. In this case a deplorable condition would arise and it might be necessary to seek the aid of Congress to place a temporary embargo on crude rubber and rubber products from Great Britain, so that American manufacturers might know where they stand and be protected against incalculable loss.

It is very much to be hoped that Great Britain will realize the injustice which is being done to American rubber manufacturers, particularly as these manufacturers and the rubber importers are undoubtedly willing to give a guaranty that they will not export to her enemies rubber or such manufactured articles as may be declared contraband of war."

THE RUBBER INDUSTRY 25 YEARS AGO AND NOW.

THIS is not a history of the growth of the rubber industry in the United States for the last 25 years. A book of 1,000 pages written by a master of condensation would not contain the story, for no other American industry has made such strides in the last quarter century.

These few paragraphs can only hope to project some of the most striking features in that development and to show the contrast between the rubber trade in 1889, when this publication first appeared, and at the present time. During these 25 years the rubber industry of the United States has increased tenfold in its capitalization, fourfold in the value of the manufactured product, fourfold in the number of employes and sixfold in volume of its exports. In 1889 the total capitalization of the rubber manufacturing companies in the United States was about \$40,000,000; the consumption of rubber amounted to 16,000 tons; the number of people employed was 20,000, and the value of manufactured product \$60,000,000. Now, the capitalization is about \$400,000,000; the annual consumption of crude rubber amounts to 50,000 tons; the number of people employed exceeds 80,000, and the value of the finished product is in the neighborhood of \$240,000,000.

But in surveying the last two and a half decades of the American rubber industry, the most striking feature is not this great general growth, but rather the entrance into the field and the rapid development of several new factors entirely unknown 25 years ago but which today are of commanding importance.

First there is the automobile tire, which now uses fully one-half of the rubber supply of the world;

which consumes more crude rubber today than the whole world produced 25 years ago; which is made and consumed to the number of 9,000,000 a year in the United States alone, with a value of \$125,000,000. And yet when the first issue of THE INDIA RUBBER WORLD was published there was not an automobile tire in existence. There were bicycle tires, and they were made in fairly large numbers, for the bicycle fever was then nearing its height, but there was no auto. tire, because there was no automobile.

There was then no manufacture of aeroplane or dirigible fabric, and the balloon as a practical utility was undreamed of. The construction of balloons and aeroplanes is not yet an extensive industry in the United States, but across the sea great advancement has been made, especially in Germany, whose military achievements have been much assisted by these overhead scouts.

Another marked development that has taken place during the last 25 years has been the advent of the great corporation. In 1889 there was hardly a company engaged in rubber manufacture in this country that was capitalized at over \$1,000,000. Now there are four companies alone whose combined outstanding capital is over \$200,000,000.

But the most important development of the quarter century just past is not in the direction of manufactures or finance, but in the direction of the crude supply—in the development of the rubber plantation. If the trade were still dependent on the wild product of the South American and African forests, rubber manufacture would only have reached half its present proportions, for it would have only half its present supply of material. In 1889 the output of the Amazon country was about 16,000 tons; in 1914 it was 40,000 tons, but constituted only 40 per cent. of the world's supply. To be sure, under the stimulus of the higher prices that would have accompanied a restricted supply, wild rubber regions would have been more exhaustively exploited, but they could not have possibly yielded a total equal to the 70,000 tons which the plantations will be easily capable of producing during the present year. With the success of the plantation now overwhelmingly demonstrated, there is positive assurance—or as positive as any human assurance can be—that, no matter what demands the trade may make in the future, the supply will always suffice.

Accordingly, of all the developments of the last 25 years in the rubber industry, the plantation, with its assurance of perennial plenty, is far the greatest.

SOME GREETINGS ON OUR 25TH BIRTHDAY.

ON October last THE INDIA RUBBER WORLD completed its first quarter century. Twenty-five years of continuous publication at least shows vitality; and when it is accompanied by constant growth in size and in sphere of influence it betokens good health. An increase from 50 pages, the average number per issue during our first year, to 150 pages, the average number in each issue during the past year, is proof positive of sound conditions and good circulation.

There are comparatively few journals associated with any industry, either in this country or abroad, that have reached their twenty-fifth milestone, and fewer still that have continued for this length of time under the same editorial management. We cannot help feeling that the record of this publication has been quite creditable and have been greatly pleased that so many members of the rubber trade agree with us in this opinion. Several pages of this issue are devoted to letters of greeting and congratulation from friends—by some of whom this publication has received a monthly welcome since its first number. There is a noticeable unanimity in these tributes to the effect that this journal has always been absolutely independent and continuously helpful to the trade. We have been rather disposed to pride ourselves on these two qualities. An industrial publication that is not independent and helpful certainly has no excuse for being.

THE INDIA RUBBER WORLD has sought not only to be helpful in the way of chronicling all news of interest to the trade, describing promptly and fully all important inventions, new processes and discoveries, but—a matter of far greater importance—it has sought so to interpret present events as to show the probabilities of the future and thus to help its readers to shape their course with a view to coming conditions. This has been particularly true of its attitude toward rubber plantations, the desirability of which—in fact the inevitable necessity for which—it has preached constantly almost from its first number, although for several years its preaching fell on deaf ears. During the last decade, however, it has had the profound satisfaction of seeing the leading American manufacturers take a substantial interest in this great field of rubber enterprise. This is only one instance in which this journal has worked unremittingly for the welfare of the whole rubber trade, at home and abroad.

With a constantly increasing staff; with correspondents in all of the world's rubber centers, and with the wish to be of still greater service to the trade in the future, we enter upon the second quarter century.

A RUBBER REPRESENTATIVE IN LONDON.

THE decision of the Rubber Club of America to have representation in London at the present time is of especial interest. Mr. Betram G. Work, President of The B. F. Goodrich Co., who sailed for England December 30 on the "Lusitania," is just the man for the place. He is as familiar with European rubber conditions as he is with American. He is personally friendly with the leaders of the rubber trade over there. His company has large interests in England and a factory in France. Moreover, he is eminently fair, forceful and sagacious.

AMERICAN MANUFACTURERS AND THE WAR.

WHEN we get plenty of rubber, which we are bound to do in time, the trade should prosper because of the war. The home market for shoes, clothing, rubber sundries, etc., will not be affected noticeably. With big crops, agricultural rubber goods, as elevator belts, will be needed. Railroad equipment will also be in demand. Special goods such as footwear, ground sheets and sundries for the belligerents will find a good market. The tire business, truck and motor, should show a constant increase.

On the other hand, the embargo, by raising the price of rubber here, has caused a loss of millions of dollars, particularly for those who had to fill contracts.

It will therefore be some time before the American manufacturer is anything but a loser by the war.

IN 1913 ENGLAND, FRANCE AND RUSSIA USED 38,000 tons of rubber. Today, with many of their factories working night and day on army and navy orders and using government specifications that call for high grade goods, they are using more rubber than ever before.

On December 1 they had in sight 9,500 tons of rubber of all kinds. That would mean about three months' supply for the Allies. It is likely that the British Government, to be on the safe side, would consider that a six months supply must be in sight before they would be safe. With much of the plantation rubber and all of the Africans coming to London, it will be probably February 1 before a surplus, say of 20,000 tons, accumulates.

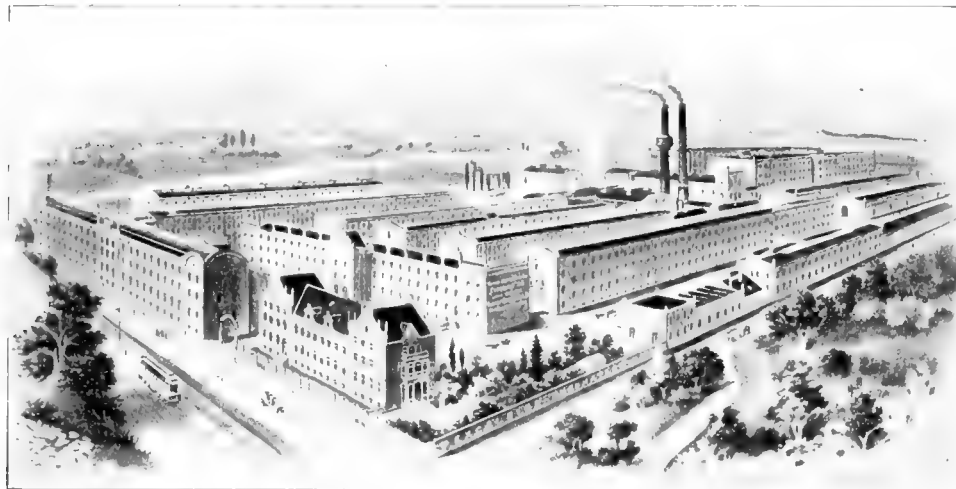
WHAT, WITH THE NEWS SUPPRESSED OR CENSORED for military reasons, do we actually know of the war's progress? Take the latest Suez Canal rumor for example:

"A strong force of Turks led by German officers appeared at (place marked out by censor). They succeeded in getting possession of a strip of the canal some ten miles in length. This they took up and removed on camels to (name blotted out). It is supposed that they have cut it into ten-foot sections and will ship it to (name deleted) to use as trenches for their troops."

With censorship of this sort how can we know whether or not rubber from the Far East will still come along?

The Rubber Industry of Germany.

THE peculiar position of Germany today hemmed in by enemies on almost every side and shut off from nearly all of those parts of the world with which commerce has hitherto been carried on makes that country particularly interesting at the present time.



TYPE OF MODERN GERMAN RUBBER FACTORY.

Though many people in the rubber trade may have had rather a hazy idea of Germany's position in the industry of the world, it probably will surprise no one to know that for many years previous to the outbreak of this unhappy war Germany had stood second to the United States in the extent of its rubber manufacture. In the matter of rubber exports it led the United States almost three to one, the German exports of rubber manufactured goods last year amounting to \$32,000,000, while those from the United States amounted to only a little over \$12,000,000. In the early part of the present year Germany could count 600 rubber manufacturing plants, of which number 150 were companies of large size and importance in the trade. These

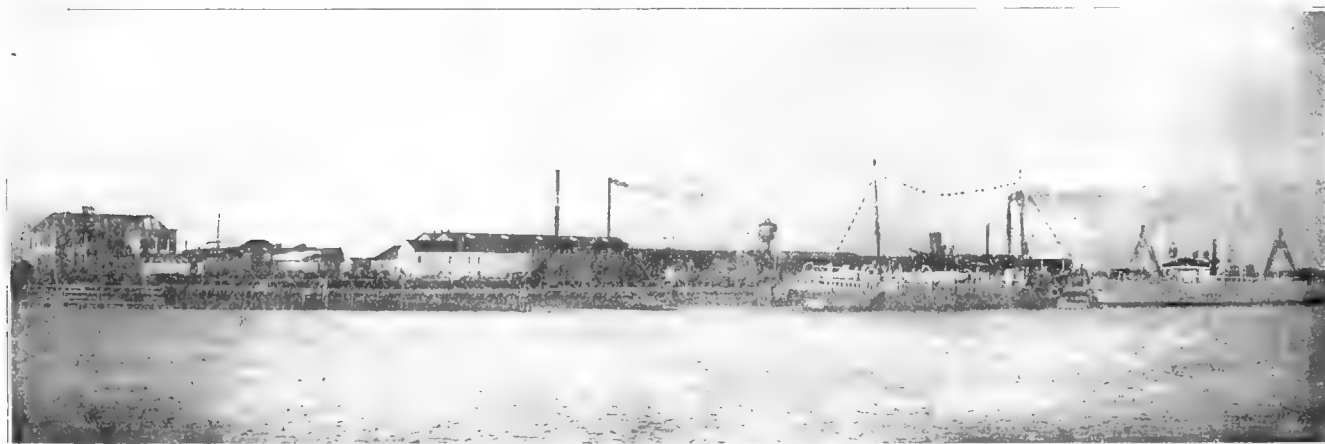
The first rubber factory was started in Germany in 1829, near Berlin. This was just about the time that the first attempts were being made in this country to utilize the product of the South American rubber forests. The first German factory was devoted to the manufacture of rubber thread and elastic fabrics, but, as Goodyear's vulcanization process had not then been discovered, the success of this early venture was probably no more marked than was the case in the various factories that sprung up in New England from 1830 to 1840.

Rubber footwear was first made in Germany in 1850, in a factory built at Mannheim, by the Etablissement Hutchinson, of Paris, which, in turn, by the way, was founded by Hiram Hutchinson, an American. In the same year the manufacture of insulated cables was started, a line in which Germany has been pre-eminently successful, the cable works in that country being for many years past the largest in the world. In 1856 the first German factory for the manufacture of hard rubber was started, being devoted to the making

of combs by a process secured from Conrad Poppenhusen, of the India Rubber Comb Co. of New York.

But just as the growth of the rubber industry in the United States was very slow up to the time of the Civil War, similarly, rubber manufacture developed slowly in Germany until the Franco-Prussian War, after which, in company with every other German industry, it advanced with marked rapidity.

Before 1880, German rubber manufacturers confined themselves almost exclusively to mechanical and surgical goods, druggists' sundries, footwear and garments, but with the advent of the pneumatic tire for bicycles, in the 80's, tire making was introduced into a number of the German factories, and with the



ONE OF THE GREAT GERMAN SUBMARINE CABLE WORKS, WITH CABLE STEAMER IN FOREGROUND.

plants gave occupation to over 40,000 workmen and were annually turning out manufactured goods to the value of about \$80,000,000.

The growth of the rubber industry in Germany has practically paralleled the development of the industry in the United States.

appearance of the automobile this industry in Germany began to grow with tremendous rapidity, until it consumed nearly one-half of the crude rubber used in German factories. Last year the tire product of that country amounted to \$38,000,000 in value, of which tires to the value of \$14,000,000 were exported.

England taking about one-fourth, France nearly as much, the remainder being shipped all over the world. Another addition to the list of rubber manufactures, which took place about thirty years ago, was the making of toys, in which German manu-



SPREADER ROOM FOR BALLOON FABRIC.

facturers also became very proficient, a sufficient proof of which has been the prevalence of German-made rubber toys in the American market during the last half dozen years.

The development of German manufacturing can be seen at a glance from the following brief table, which shows the number of factories at different periods during the last fifty years and the number of employees connected with these factories.

These figures embrace all lines of rubber manufacture where crude rubber is washed, mixed and prepared in the factory in which the goods are finished. Tire repair shops are not included:

	Number of Factories.	Persons Employed.
1861	36	1,788
1875	120	5,635
1882	243	7,666
1895	450	13,114
1907	539	31,909
1914	600	40,000

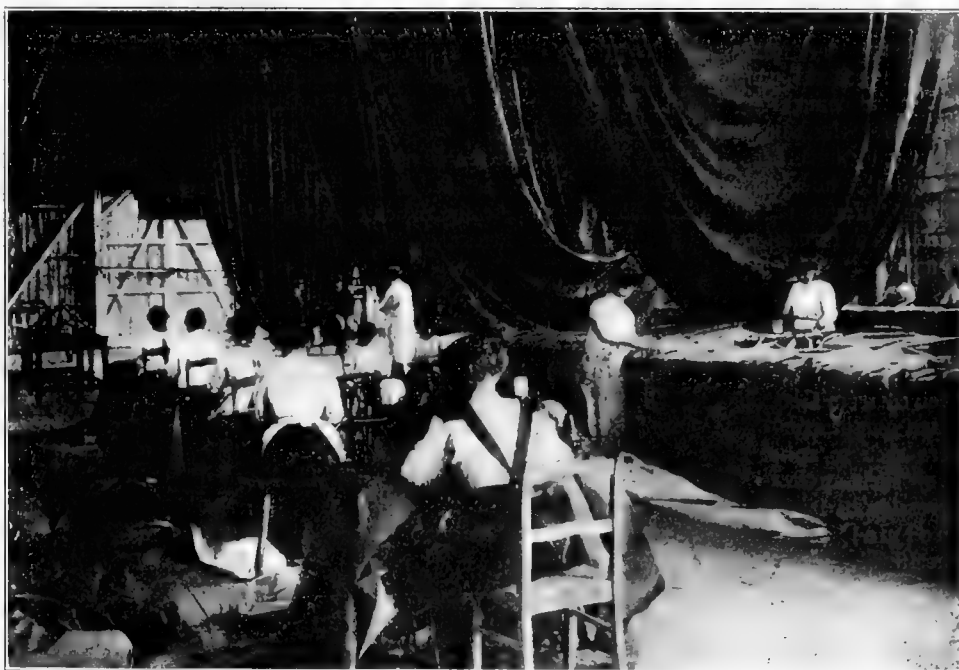
Another gage of the growth of the rubber industry in Germany is found in the notable increase in the imports of crude rubber into that country. In 1889 they amounted to 4,000 tons; ten years later nearly 14,000 tons; in 1909, a little over 27,000 tons, and in 1913 about 29,000 tons. To be sure, not all of this rubber was retained by the German manufacturers, from one-quarter to one-third of it being exported in this crude condition, the exports in 1889 equaling 700 tons; in 1899, over 5,000 tons; in 1909, 9,000 tons, and in 1913, 10,000 tons. This left for German consumption at the three periods, 1889, 1899 and 1909, something over 3,000, 8,000 and 18,000 tons, respectively, while in 1913 the rubber used by German manufacturers was 19,000 tons. Perhaps the most interesting statistical phase of the German rubber industry lies in the increase in exports of its manufactured goods. German rubber goods exports in 1889 were valued at about \$5,800,000; in 1899 at \$13,000,000; in 1909 at \$14,000,000, and in 1913 at \$32,000,000.

The Germans have been particularly successful in the discovery and use of rubber substitutes. They have also led the world in their long continued and systematic search for syn-

thetic rubber. It will undoubtedly be remembered that Dr. Duisberg, Director General of the Farbenfabriken, of Elberfeld, read a most interesting paper on synthetic rubber at the International Congress of Applied Chemistry, held in New York in September, 1912. He displayed at that time a set of tires made of this artificial product, another set having been made and presented to the Kaiser. Dr. Duisberg and his co-laborers, Drs. Fritz Hofmann and Carl Harries, are celebrated among chemists for the work they have been doing for a number of years past on the absorbing problem of synthetic rubber.

In a general way it may be said that during the last few decades rubber manufacture in Germany has been a highly progressive and successful department of German industry. It received that same scientific, painstaking, systematic attention that Germans have devoted to every industrial and commercial branch. Unlike American or British, German manufacturers have received a great amount of the most valuable help from the universities and technical schools. In other words, the government helped in every way possible.

Of the 600 companies, large and small, engaged in various kinds of rubber manufacture, there were at the beginning of this year about 10 important companies making tires, nearly the same number engaged in the production of rubber footwear, at least 20 large companies making cables—and probably 15 important manufacturers of rubber machinery, among them the famous house of Krupp. There are quite a number of rubber manufacturing companies in Germany that have been established over 50 years, and a long list which have been in business over a third of a century; and some of these companies are of a magnitude that would compare favorably with the large rubber manufacturing corporations of the United States. For instance, there is the Continental India Rubber & Gutta Percha Co., Hannover, which normally employs 7,000 workmen; the



MAKING GAS BAGS FOR WAR BALLOONS.

Vereinigte Harburg-Wien Gummiwarenfabriken, the Vienna factory employing 4,500 people, and the Harburg 2,500 workmen. The total capitalization of the German rubber industry at the beginning of this year was \$25,000,000, and it might be safely said that this capitalization was conservative. The industry undoubtedly had a working capital of twice that sum, while its annual output of finished goods was from three to four times its capitalization.

The enterprising and courteous founders and heads of the great German rubber factories are men known the world over—Seligman, Prinzhorn and Dr. Gerlach of the Continental; Hoff of the Harburg-Wein; Clouth of Cologne-Nippes; Calmon of Hamburg; Spannagel of Berlin; Sierke of the Gummi-Kamm; not to forget the scholarly Dr. Traut, and many others.

The German accomplishments in hard rubber have been wonderful. This is true not only in the production of technical articles that have found a market all over the world, but in the most difficult art work. For example, there is the beautiful 6 foot statue of Arminius, prince of the Cherusci, after his victory over the Roman legions under Varus. This statue was modeled by Engelhard, of Hannover, molded in hard rubber, in one piece, at the Traut factory at Hamburg.

In addition to the importation and manufacture of rubber, Germany has taken a deep interest in developing rubber producing sources in its various protectorates, namely—German East Africa, German Southeast Africa, Cameroon and Togo. The receipts of rubber from these four foreign possessions have quite steadily increased during the last eight years. In 1908 they equaled 1,341 tons; the following year 1,645 tons; in 1910 2,566 tons, and in 1913, 4,000 tons.

To be sure, last year rubber manufacturing in Germany, in common with the industry elsewhere, suffered something of a recession in its output and its profits, owing to the general conditions that obtained all over the commercial world. But had it not been for the war, that situation would undoubtedly have been but temporary. With the breaking out of hostilities, however, the German industry received a staggering blow. Under the circumstances it is naturally difficult to get detailed information as to industrial conditions in the Kaiser's empire. Not only is every news channel officially guarded, but private letters received from German manufacturers seek to convey such an impression of fairly normal and healthful conditions that one cannot help feeling that patriotism supplies a color to the picture that accuracy would not warrant.

Enough information, however, that has come through the barriers that surround that Em-



STATUE OF ARMINIUS, MADE OF HARD RUBBER.

pire to show that, as one would naturally expect, the only rubber factories running on full time and with large orders ahead are those working for the military equipment of the German army, making tires for the army autos., balloon fabrics, cables, footwear and clothing for the soldiers, rubber sheets which they may interpose between themselves and the damp ground when they lie down at night, and other necessary kinds of equipment for the men in the field. Naturally, the consumption of rubber goods by those not engaged at the front has fallen off tremendously. The manufacture of what might be termed the unnecessary—that is, sporting goods, balls, toys, and all articles coming under the general classification of luxuries—has been stopped absolutely. The sale of tires has practically been taken over by the government. Private users are not permitted to purchase any tires which are good enough for military use. In fact the whole rubber manufacture of Germany is under government supervision, and the chemists and workmen necessary to carry out the government orders in rubber factories have, wherever possible, been exempt from military duty. But in other factories, whose output is not so essential for the operations at the front, the roster of workmen has been, of course, greatly depleted, so that inadequacy of help and extreme difficulty in securing transportation are two of the many burdens that the German rubber trade has to bear.

But the one paramount question with the German rubber mills is not so much a market for their finished goods as a supply of the crude material. It is not likely that Germany had stored away any large supply of crude rubber. That is shown by the fact that over one-third of the crude rubber imported into Germany in 1913 was exported during the year. The probability is that the supply in stock on the first of August was

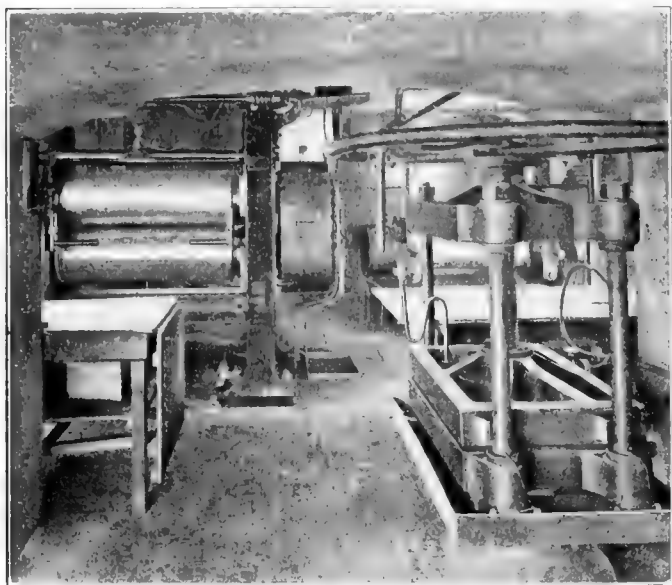
not greatly in excess of the supply a year ago. While the Kaiser's military experts no doubt believed that a war was on its way, they confidently expected that it would be a short war and soon over, and therefore did not think it necessary to make provision against any long suspension of commercial communications. To be sure, some crude rubber has found its way into Germany via Holland and Sweden



SUNDRIES' DEPARTMENT IN GERMAN RUBBER FACTORY.

in the north and Italy and Switzerland in the south, but the amounts received through these channels must necessarily have been small and are likely to be discontinued altogether. The latest quotations on crude rubber in Germany show that it is selling for over twice its price in London and New York markets. If the war should continue another year, with conditions as they are at present, the Allies having a fairly free sweep of the seas, the German manufacturers would certainly be in a sad quandary over the matter of supplies. Many of the factories, as a matter of fact, have already been closed.

But even if the war were to stop tomorrow, the loss to the German rubber industry would be enormous. Granted that the



PACKING DEPARTMENT IN A GERMAN FACTORY

manufacturers of that country could quickly recover their former markets in South America and other neutral countries, it must be remembered that their largest customers were their near neighbors; and it is hardly likely that the people of England, France and Belgium will look with any favor on goods stamped "Made in Germany" for many years to come.

This story of the rubber situation in Germany would hardly be complete without referring to the courage with which the German manufacturers have borne their losses and the generosity that they have displayed toward their workmen. Practically all the large companies are supporting the families dependent upon employes who have gone to the front—and this notwithstanding the large and continuous drain upon their resources.

THE AMERICAN RUBBER INDUSTRY PARALYZED.

A paragraph in a recent German paper, speaking of the embargo on exports of rubber from all English ports and its effect upon the United States, remarks that the American rubber industry is paralyzed. Which is another proof that one is obliged often to go far from home to get the news.

The American Association of Commerce and Trade in Berlin, organized in 1903, with offices at Friederich Strasse 59-60, by American citizens engaged in business in Berlin, to foster commercial relations between the two countries, is issuing weekly reports on general conditions in Germany during the present crisis. A report just received contains an item to the effect that the secretary of the association, Professor George S. Atwood, was at the time of publication—November 12—in the United States, and that he would be pleased to receive and answer any inquiries directed to him in care of the National City Bank.

RUBBER AT THE SAFETY SHOW.

AT the International Exposition of Safety and Sanitation, held at the Grand Central Palace, New York, during December, rubber was more or less in evidence, and in some exhibits quite important.

The most spectacular part of the show was the demonstration of the efficacy of the "Lungmotor." This is a double cylinder arrangement, designed to assist those who for any reason whatever have ceased to breathe. It has an equipment of rubber tubes and rubber mouthpiece, which would place it in the category of rubber appliances. The spectacular part of it was when a young lady professional swimmer exhibited its use in a large tank full of water.

Very many of the exhibits showed as incidentals old and new types of hose. The B. F. Sturtevant Co., Boston, exhibited a vacuum cleaner, with many lengths of ordinary vacuum hose; the Pullman Co. exhibited a huge vacuum cleaner with correspondingly large hose for cleaning "Pullman" cars; the West Disinfecting Co. showed their protector equipped with special hose for sterilizing passenger car water coolers; while the New York Edison Co. showed 4-inch, wire-wound hose, connected with a special blower for ventilating gas-containing manholes. Speaking of the Edison company, aside from the insulated wire they use for their hundred and one devices, they exhibited huge rubber sleeves for overhead line protectors, insulated platforms for use in manholes, special linemen's rubber gloves, insulated screw-drivers, etc., etc. Quite in their line was the projector of The Precision Machine Co., Inc., New York, which is electrical and uses much insulated wire.

Something that makers of rubber diving suits may look upon with doubt is the aluminum diving armor of the Submarine Diving & Recovering Co., New York. While this may do away with a certain amount of rubber it still needs air hose, insulated wire for the diver's telephone, etc.

Speaking of armors leads one up to the "Nasdeo" breathing helmet, which enables a man to walk in the smokiest conflagration and breathe pure air from the feed hose that drags on the ground behind him. In this connection it is proper to mention the exhibit of Covers rubber respirators, which in a measure serve the same purpose.

There was a variety of novelties shown in the line of special sundries, such as the vibrator of The Stevens Invention Co., vacuum massage brushes and rolls, the Stevens pocket vaporizer and chemists' rubber goggles of the Willson style. The Life Extension Institute, Inc., showed a great variety of therapeutical instruments in rubber, glass and steel. There was also the Emil Greiner Co.'s apparatus for the analysis of mine gases, which employs rubber tubing and rubber gas bags.

In up-to-date novelties there was the Lightning vehicle washer, with its rubber protected sponge and length of hose; the American Washing Co.'s washer, with its rubber cylinders and their suction cells; the Morrison foot suction grip ladders, made of high grade red rubber; the Angell elevator safety lock, rubber padded at each end.

In the line of automobiles was the "Telescopic" fender from Cleveland, and the Elastic Safety Buffer of New York—both rubber in part.

Of interest also to the rubber men was the "Clipper" belt lacer, and a ladle for those who make soft metal molds shown by the Western Electric & Manufacturing Co., East Pittsburgh, Pennsylvania. This ladle is so arranged that no matter how full it is it always pours from the bottom.

The Bristol Co., Waterbury, Connecticut, among other things, showed their patented safety set screws and incidentally advertised the fact that companies like the Rubber Regenerating Co., Goodyear's Metallic Rubber Shoe Co., John A. Roehling's Sons Co. and other rubber men were users of them.

What Rubber Manufacturers Want in Crude Rubber.

By The Editor.

[Suggestions to Rubber Growers, for Guidance When the Embargo is Lifted.]

IN the first place, they want rubber, plenty of it, all the time. They want it at a fair price, the same price that their neighbors pay. They desire clean rubber, but can use dirty rubber at a price that will pay them to clean it.

There are certain rubber manufacturers who are always in the market for new types of wild rubber as well as for grades that only appear in small lots and at infrequent intervals. This is not because these grades are better than those that are standard, but, being untried, are viewed with doubt and have not a ready market; hence, those who can use them get such rubber at low prices. Certain grades of rubber that are standard also become scarce for a time, or are in such demand that the price becomes relatively high. Manufacturers then substitute other grades, or they mix two or more in different grades and get by the amalgamation a product equal to a higher grade. Such substitution and amalgamation, however, is the result of conditions and is not sought for. In the long run the great variety of grades, with their wide variations in cleanliness, wetness, texture, physical shape, resin contents, etc., is a distinct disadvantage and a bar to efficiency.

One needs only to glance back over the rubber market of the past ten years to note that there have been from 50 to 60 grades of Brazilian, 20 to 30 of Central and 50 to 60 African brands constantly available; and in addition a half hundred bastard rubbers that were used in times of high prices.

If there were only one grade of rubber, standardized as to quality and price, it would be better than the present heterogeneous jumble of grades. That, however, is not likely to come to pass.

The change in grades that will occur will be the gradual disappearance from the market of the resinous, dirty, cheap rubbers. The high grades of wild rubber, together with plantation rubber, will possess the market. There will come also a new nomenclature, and the somewhat picturesque names that now exist, that are arbitrary and non-descriptive, will be superseded by names that are not only descriptive but that are a warrant of quality. Until some general super-excellent rubber is produced in such quantities that it dominates the market, it would be of great assistance to manufacturers if large producers of plantation rubber would adopt brands and protect them as trade marks. And even then there is bound to be imitation, with the intent to deceive. For example, if Highlands and Lowlands were grades eagerly sought by the manufacturers, some imitator is sure to brand his rubber "Hi Lands" and "Lo Lands."

That the rubber manufacturers desire clean rubber cannot be for a moment doubted. The fact that they have in the past been forced to install great washing plants to remove bark, sand and a variety of deleterious substances, and that they still use such machinery, does not argue that they would not be glad to receive all kinds of rubber so clean that factory washing would be superfluous. The cost of washing has in the past added at least $1\frac{1}{2}$ cent a pound to the price of the rubber used by them. Taking all wild rubber, including bastard gums, at 200,000,000 pounds, the cost to them would be \$1,000,000 annually. Then there is the shrinkage from moisture and dirt, much of the cost of which often falls upon the manufacturer. Beyond this is the freight charge on the water and dirt, which, at the high rates that have heretofore obtained from the African and Amazonian sources of supply, is

a great annual loss to the rubber trade. The trade would, therefore, welcome the abatement of these unnecessary charges, an abatement that plantation rubber has already begun to put in force.

The shrinkage of wild rubber has been and still is a burden, a reminder of industrial slovenliness and unthrift. It has profited, temporarily only, the rubber gatherer and rubber seller. In the long run it has proved costly—to the rubber manufacturer most of all. The first cost to the manufacturer is in the purchase for rubber that which is not rubber. The second cost, the most serious, is the presence of bits of deleterious material which the washing does not wholly remove and which in the finished goods often produce flaws that render them unmarketable. Thus a sliver of wood bedded in a sheet of rubber may pass through washers, mixers, calenders, vulcanizers and be just under the surface in a finished rubber coat. Then, when in use, it breaks through the surface, opening an ugly scar, and the coat is returned, a total loss to the maker. So, too, with grains of sand that finally show in a pitted, porous surface.

They, therefore, want a better rubber than has yet been produced. Today the best rubber in the world is Upriver fine. It is, at its best, a splendid rubber. Little by little plantation *Hevea* is approaching it in excellence. If there is anything in selection, in the application of science to rubber problems, plantation rubber should not only equal Upriver fine in every respect but should eventually so far surpass it as to establish a new standard of excellence.

Rubber producers, particularly from cultivated trees, are ever striving to put on the market gum that is as light colored as may be. Indeed successful efforts have been made to secure a product that is almost white. As the great majority of finished rubber goods are black—the result of sulphur mixing and vulcanization by heat—color or lack of it is of very little interest to rubber manufacturers. A jet black, clean, nervy rubber will command just as good a price as a straw colored or a white rubber.

Of the hundreds of rubber manufacturers in the world only a small percentage are financially interested in rubber plantations. Their attitude is that the production of finished rubber goods is enough to engross their energies and capital. They are perfectly satisfied to leave the production of the crude material to those who specialize in it.

In the process of manufacture, rubber is first washed, then dried and then massed—the last to render it homogeneous and ready to take up the sulphur, metallic oxides and the like that go to make up the compound. Plantation rubber will eventually render washing and drying unnecessary, for clean, dry rubber will be produced. It is possible, too, that so homogeneous a product will be evolved that massing will also be unnecessary. The last word upon ideal coagulation has not by any means been said. How latex is coagulated—whether by acetic acid or smoke—does not interest the user of the rubber. His interest lies in the cleanliness, nerve and uniformity of the product.

That plantation rubber will evolve a variety of new grades for a time is probable. It is also likely that varying methods of compounding and vulcanizing on the part of manufacturers—all of whom have their own processes—will serve to bring out many qualities in special grades that may be of more or less general importance. But that certain grades of plantation rubbers will always continue to be selected, some for

rubber cements, others for hard rubber, still others for insulation, and so on, is hardly likely. The general qualities called for are resilience, impermeability and toughness. For example: In motor tires impermeability and toughness are necessary; in clothing, impermeability and plasticity; in wire covering, the same; but in rubber thread, elastic bands and goods of that type, elasticity is also required. An extremely resilient crude rubber is just as adaptable for goods that call for only plasticity and impermeability, and some time in the future such a standard high grade will be evolved and used for all of the varied lines that now comprise rubber manufacture.

Efforts to corner rubber, such as that attempted by Vianna in 1882 and others a few years later, are not viewed by rubber manufacturers with the slightest degree of tolerance. They have in the past, fortunately, resulted in failure on the part of the speculators and, as a whole, meant loss to the rubber trade. So, too, fluctuations in price, whether from speculative or natural cause, have proved a distinct handicap. If crude rubber be very high manufacturers find it difficult to get increased prices for their goods. Many articles in rubber if too high priced are displaced by others that contain no rubber. For example, leather belting takes the place of rubber belting, twine is used instead of elastic bands, etc., etc. In the event of a sudden drop in price of crude rubber, orders placed by wholesale dealers are cancelled and new orders placed at a lower price with other manufacturers. Hence, corners and fluctuations in price are feared by the rubber manufacturing trade at large, and are a serious drawback to a regular and healthy growth.

That rubber manufacturers will view possible efforts of rubber planters to curtail production and thus maintain high prices with favor can be denied. Such action may keep prices up for a time, but it will inevitably stimulate outside planting in all parts of the tropical world. It will also be a distinct advantage to those who have partially established plantations in localities not blessed with cheap labor. Further than this, it will be a constant incentive to those distinguished and scholarly German chemists who are step by step advancing toward the commercial production of synthetic rubber.

The rubber manufacturer produces his quota of goods whether the price of Fine Para be \$1 or \$3 a pound. Really what most concerns him is that the price be the same to all and that violent fluctuations in price be done away with.

For a product so valuable, india rubber has suffered from careless and inadequate packing more than any other commodity. In the past, rubber worth anywhere from \$1 to \$2 a pound, and even more, has been sent thousands of miles in rough boxes, in fragile crates, in burlap bags. It has been stored where it came in contact with water, oil, heated air and dirt in infinite variety. So loosely packed was it and so carelessly guarded that its theft was of daily occurrence. An urgent necessity, therefore, is some form of packing that shall at once be secure, cleanly and economical.

In considering this, however, there comes the important question of the physical shape of the rubber to be packed. Shall it be in the form of balls or pelles, sheets, slabs, sausages or what? Wild rubber has come in all of these shapes, and more. Is there any reason for accepting any one of these forms as embodying the best ideas? They all have their advocates, but they are without exception those who gather it in the jungle and who find it most convenient to make the shapes in which they send their rubber.

The pelle is not capable of being packed without waste. It holds moisture a long time and it must be soaked in hot water and cut open before the machines can handle it. Small balls and sausages gather much dirt, leave much of their surface open to oxidization and are easily stolen. Sheets like the crepe of commerce have all to be pulled apart before

use, and a pound or two torn from one end is not missed. It would seem, therefore, that some form having always standard dimensions, and branded with the name of the plantation, would be a step in advance. Rubber in such form would be hard to steal, or hard to dispose of when stolen, would pack without waste of space and would be exceedingly easy to handle in weighing. As for the wooden boxes, planed boards should be always used. Of course the ideal shipping package would be one built of material produced near the plantation, something that could be used or sold after it was emptied. That, however, is yet to be evolved.

The theft of rubber is common. In the past, rubber gatherers, importers and manufacturers have all been sufferers. On the part of manufacturers many attempts have been made to bring the thieves to justice, but the difficulty in establishing title to pelles and chunks that are hardly distinguishable one from the other has usually resulted in failure. With uniform shape, plantation brands, adequate packing and direct shipment from plantation to factory, most of this thieving would be impossible, or at least easily detected. Once in the factory, the manufacturer is able to guard his rubber pretty safely. There is a movement, inaugurated by the Rubber Club of America, to destroy the market for stolen rubber by invoking the assistance of manufacturers and the wholesale handlers of rubber waste. These firms not only refuse to handle lots of rubber offered by those who cannot show a clear title to the goods, but they also report any such offerings to the Rubber Club. Such procedure will in time, no doubt, reduce rubber stealing to a minimum. Perhaps it is the rubber planter who will in the next decade suffer most from rubber thieves. Certain it is that if once the thrifty peasants of the Middle East ever establish every man his own little plantation of *Hevea*, some of his richer neighbors' rubber will be likely to swell the product of his own trees.

The middle man, the importer, has in the past played a very important part in crude rubber. He has provided capital for many factories and financed aviators and producers the world over. His operations have been large and his profits commensurate. As in other lines, it is probable that he will always have a place. With the growth of the plantation industry, the standardization of grades and the close relations between producer and user, his activities, however, are likely to be lessened. Rubber importing as a definite commission business will take the place of speculative importing, juggling of grades and creation of new types from ingenious rearrangement of old. Nor is it likely that rubber manufacturers will long continue to pay commissions to those who receive rubber simply to re-pack and re-ship it to them. Still further they will view with distinct relief the abandonment of the ancient storage vaults that reek with moisture.

A simple form of contract that will be universal and fair to both buyer and seller is something that the majority of rubber manufacturers most earnestly desire. In the past there have been a variety of contracts that were sometimes binding and sometimes not. There have not been wanting instances when importers sold for forward delivery at a price, and if the market went down rushed deliveries ahead of time and in increased amounts, or when it went up delayed deliveries for months, substituted poorer sorts to gain time or refused to fill orders at all. On the other hand, there have been times when manufacturers buying at high prices, and experiencing a falling of prices, refused to take the rubber contracted for. Of course, a steady market price, which plantation rubber will in time effect, will do away with such temptation to a degree; and a uniform, clear contract will do the rest.

Speaking of the attitude of American rubber manufacturers toward plantation rubber, they are very friendly, but at the same time are constantly provoked by the mixed shipments

and the unreliable naming of grades. It would be possible to fill pages with protests, and just ones. A sample from one of the large and alert manufacturers will suffice.

"The ridiculousness of the present method of grading this rubber is a thing that I cannot understand. Of a five-ton delivery of so-called First Latex from ——— to this company there were seven distinct varieties, all the way from the finest thin pale crepe up to heavy amber gristly sheet $1\frac{1}{2}$ inch thick. Apparently all this is decided by some wise man in the warehouse in London, who decides that this or that grade is or is not this or some other grade. All of which, in this enlightened age of scientific management and laboratories, strikes me as being a little more than particularly 'asinine.'"

Another point that is emphasized is the lack of nerve in some of the best looking rubber, said to be due to too much milling. Rubber manufacturers all know that the best crude rubber loses its nerve if massed too much. It is therefore presumed that too much milling in the plantation factory will bring about the same result.

RUBBER SHOE VARNISH.

By a Veteran Rubber Shoe Mill Superintendent

THE first recipe for rubber shoe varnish came into my possession fifty years ago. It was called the "Isaac Williams Varnish." It read: Boil oil till it becomes thick as molasses, add 14 ounces of sulphur to one gallon of oil and one and one half gallons of camphene. Here is another recipe from my book of that date: Two gallons oil, one pound sulphur, one ounce sugar lead and benzene.

From the same book came the following recipes for preparing coal tar: One gallon coal tar, 4 pounds sulphur, 4 pounds rosin; melt and mix. Another is: No. 1—10 gallons tar, 40 pounds sulphur; mix. No. 2—100 pounds rosin, melt and add 15 gallons benzene. To No. 1 add $4\frac{1}{2}$ gallons of No. 2.

Forty years ago some one showed me a small sample of what was said to be Russian varnish, and said if I could make varnish like it my fortune was made. A few years ago I was shown by a man who had worked in the Russian factory the way *he said* it was made; and while it differs in the compound, the varnish does not vary much from American varnish. Their way of vulcanizing, in which the shoe is taken from the heater in a tacky state, and allowed to dry one week before packing, is the secret.

A man named Story went from this country some 50 years ago and had much to do with starting the Liverpool Rubber Co., Liverpool, England, the North British Rubber Co., Edinburgh, and the Russian-American Co., Petrograd. Charles Hotchkiss was also with the Hutchinson Etablissement in France at the same time, and they probably used the same formulas in every factory.

For many years Charles Ensign, who came to the Goodyear Metallic Rubber Shoe Co. about 1859, and was superintendent until the fall of 1881, was the recognized authority on making varnish. Whether he improved the recipe that came to him I cannot say, but his formula was used by most American firms a few years ago. The following oils are used: Calcutta, Baltic, blown oil, Craig and Rose thick oil, and common linseed oil. The boiling varies as to time from 8 hours to 300 or more. I made varnish 4 years without boiling the oil. This takes longer but makes a more elastic varnish. The compounds used do not vary much from oil, sulphur and rosin, but I have found the following all used: Lime, shellac, gilsouite, sugar of lead, litharge, white lead and small quantities of commercial varnish.

Putting the compound into the kettle so that it comes in contact with the bottom is wrong; the proper way is to suspend it 3 or 4 inches from the bottom. When thinning use one gallon turpentine first, before putting in naphtha. This improves the varnish.

One way of making varnish is to keep out 3 gallons of oil, using only 7 gallons, and when the varnish rises toward the top of the kettle, add the 3 gallons of oil, which will cause it to settle. Then take from fire. Another way is to use a steam jacket kettle, putting in oil and compounds, and covering with turpentine. Still another is to take lime and rosin, melt and mix, cool and make into fine powder, after which add sulphur. The oil is made thick for this varnish. Another method calls for the use of blown oil. The rule is, the thicker the oil the less sulphur.

Different factories run different heats, from 5 to 11 hours, and varnish is made to suit. In many places a dryer is used, made by a well known varnish firm. In fact many use this varnish and dryer entirely. Most heaters are run to suit varnish rather than stock, and until heaters are constructed on right lines shoes in different parts of the heater will vary. The surface of upper stock has much to do with the appearance of varnish. If surface is hard it will crack and crawl. For some years I made up stock with billiard and thread scrap instead of new Pará, and the varnish seemed to have a firmer hold and to be less liable to crack.

For several years I made it a point to have samples of upper and soling of different grades of the day's running varnished and put in two sections of the heater every night. Next morning I tried the tensile strength, noted the adhesion of varnish, etc., also had small discs of same stock made under pressure. The specific gravity of these discs was taken every day and record kept, and once a week specific gravity was taken of all stock used in shoes. All stocks were run by weight, not by gage.

Many heaters are run as to time by taking out shoes and testing them when it is thought they are about vulcanized. This reminds me of a heater man 40 years ago. When the steam dry heater was put in place of the pot heater, this man ran it on same lines, taking strips of each kind of stock that was in the heater, which he hung inside about a foot from the small door. After the heat had been running some time he would take them out and test with thumb nail until he thought they were properly vulcanized; and while in charge of the heater he never used a thermometer as his sight was failing and he could not see it.

OPPORTUNITIES FOR MOTOR VEHICLES IN RUSSIA.

Practically all the automobiles, motor trucks and motorcycles in Russia having been requisitioned for military purposes, Consul F. Willoughby Smith, of Batum, calls attention to this fact, adding that the country will be obliged to readjust its centers of distribution and channels of trade, while seeking new sources from which to draw supplies. As soon as the danger of further requisitions has passed, there will necessarily be a great demand for all descriptions of motor vehicles, which are largely used in the oil fields and mines, as well as on farms and in manufacturing enterprises.

TIRES IN NETHERLAND EAST INDIES.

The principal automobile tires represented in Java at the close of 1913 included: American tires made by the Goodrich Tire Co.; British tires, made by the Dunlop Tire Co.; Michelin tires, made in France; the German Continental tire and the Prowodnik tire, made in Russia. East Java is the location of the Goodrich agency in that market. In 1913 the total imports into Dutch East India included tires for automobiles to the value of \$590,000 and for bicycles to the value of \$180,250; the American tires representing \$8,000 and \$720.

AMERICAN RUBBER SHOES IN SYRIA.

An American consul is authority for the statement that some years ago a considerable quantity of American rubber shoes was sold in Damascus, but the dealers ruined the trade by only bringing in the cheaper grades. All the rubber shoes worn in that section have in consequence been brought of late from Russia.

A Remarkable Salvage Operation Which Rubber Made Possible.

By Robert G. Skerrett.

THE submarine diver is able to follow his calling and to do the things that amaze, at times, mainly because of the vitally necessary part that india rubber plays in his equipment. There are about 400 commercial divers in the United States, but all of these men are not equal to really deep submergences, and the man that can go down 150 feet and there do good work is the exception rather than the rule. But aside from these men there are other under-water workers



GROUP OF MASTER DIVERS

of whom the public hears but little. These are the qualified divers in the navy, who are officially known as seamen gunners.

The seaman gunner is the all-around handy man or enlisted specialist of the battle fleet, and part of his comprehensive training is submarine diving. When he dons his diving dress he generally goes overboard to look for a lost torpedo, a stray anchor, or to examine the bottom of the ship on which he is serving. For this work the sailorman is not required to go to any considerable depth, therefore he qualifies at the training school at Newport by proving his fitness to operate at but 60 feet below the surface. Every fighting ship in the United States navy has a number of these men aboard, being in this respect like the battle craft of the British navy. The story we have to tell is how some divers of the English navy, from the cruiser "E-sex," with other of their citizen fellows from Canada and the United States, recently completed an exceedingly hazardous under-water task in connection with the sunken steamer "Empress of Ireland."

The reason the British naval divers took so important a part in this work was because the admiralty set the pace a few years ago in certain revolutionary experiments which showed how men properly trained and suitably equipped could descend to a depth of 200 feet and assist there in the recovery of sunken property. Prior to that, a good many divers had lost their lives by submergences at lesser depths, and among these were seamen in the royal navy. The medical men and physicists engaged in that investigation found out how the "bends," paralysis and sacrifices of life could be avoided while actually increasing the operative zone of the under-water worker. Following upon these disclosures some important improvements have been made in the elastic diving dress

as well as in the armored rubber air hose and the hand pumps employed in furnishing an ample supply of air to the diver at a suitable pressure—the latter always regulated by the distance below the surface of the water.

Before going into the details of the salvage of the "Empress of Ireland," a few paragraphs may properly be inserted here descriptive of the diver's equipment, to show how necessary a part of this equipment rubber constitutes.

A modern diving dress consists essentially of two parts—the bronze helmet and collar or corselet and the elastic body-covering, which is secured to it, extending from the shoulders to the feet. In dressing, the diver gets into his one-piece waterproof garment through the opening at the shoulders or neck, and this section of his dress is akin to one type of nightdrawers for children. The only openings are at the neck and the cuffs, the feet being covered by an integral part of the dress. It is in this portion of the so-called submarine armor that rubber plays so conspicuous a part. This garment of the diver is made of solid sheet india rubber, between two layers of tanned twill. It has an inner and an outer collar, the inner one (sometimes called the "bib") of the same material as that of the dress, to pull up round the neck, and the outer one, of india rubber, to go over the breast plate or corselet to form a water-tight joint. The cuffs are also of rubber and fit tightly round the wrists, making, when secured by the rubber rings, a water-tight joint, at the same time leaving the diver's hands free.

The rings for the wrists go over the rubber cuffs, and two or more of them may be required, depending upon the conditions under which the man is working. Now, of course, a



PAIR OF DIVERS AT WORK

diver could not work without air being sent down to him from the surface, and armored rubber hose is the means by which this vital current is forced down to him through the agency of suitable pumps or tanks charged with a supply of compressed air. As has been said by one of the world's largest manufacturers of diving equipment: "It is of the utmost importance that the diver's air pipe should be of the strongest and best description, and we do not hesitate to assert from our long experience that hose of less than 5-ply should never be used for deep-water work. Our hose is made from the best possible materials, and before it is allowed to leave our works every length is tested to a pressure of 300 pounds per

square inch and must show no sign of increase of diameter whilst under that pressure. All our hose is armored by a spiral support of tinned steel wire embedded in the texture."

The helmet is screwed down upon the corselet and made tight by a rubber gasket, and the face plate is sealed in the same fashion by a suitable ring of rubber. Of course this does not cover what might be called the additional features of a diver's costume, which include stout leather boots, with wooden soles, to which are riveted lead soles; leaden weights upon his back and chest to carry him to the bottom notwithstanding the air inside of his suit; the telephone equipment inside of his helmet; his lifeline, which has in its core the telephone circuit; the india rubber mittens which he may have to wear when the water is very cold; his submarine lamp; shoulder pad to take the pressure of the heavy metal head dress, and the belt and sheath in which the under-water worker carries his knife and possibly additional lead weights to hold him more firmly upon the bottom against the sweep of a strong current.

Should a diver fall so that his body be prone or his head lower than his waist, there is danger that the air may flow from the helmet into the elastic dress and inflate it. In deep water the rubber suiting is pressed very snugly against the diver's body by the surrounding water and very little air remains there. When he loses his balance, however, this state of affairs might be changed, to his peril, his suit become distended, and the diver floated hastily surfaceward, with the possible chance of the dress bursting and the man being drowned or otherwise menaced by the sudden lessening of the water pressure on his way upward. Therefore, the very latest improvement in diving dresses is one that permits the lacing up of the legs so that the suit is held always close to the body and cannot be filled with buoyant air even though the diver fall. This gives him much greater freedom of action. He can bend over or stoop, or even crawl along the bottom, if his work require, and he need not fear the inflating and dangerous expansion of his covering.

It would be hard to tell just how many submarine divers there are in other parts of the world, but their employment is very extensive. In the northern waters of Europe their services are principally for salvage operations and subaqueous engineering tasks; and these demands are many. In the Mediterranean and in the warm waters of the Southern Pacific and the Indian Ocean, sponge gatherers and pearl hunters use diving suits such as we have described, in great numbers, and the Japanese shell hunters in their native waters and in southern California do the same thing. Therefore, it may be reasonably declared that thousands of submarine diving suits are in use, and the manufacturing industry is a large and very profitable one. This is particularly so in England and Germany.

A diving suit, like any other character of dress, has a long or short life, depending upon the nature of the jobs. The average dress is good for two or three years if carefully handled and the demands are not rugged. However, the elastic part of the suit may survive only a few days' or a few hours' stress. In cutting the big hole through the hull of the "Empress of Ireland," described later, the long spiral steel shavings that were made by the drills were particularly harmful to the rubber canvas legs of the suits and, despite the use of protecting knee-pads, the tough fabric of rubber and oak-tanned twill was soon pierced. Of course these holes can be patched, but no experienced diver wants to use the dress again for his deeper submergences.

As most of us know, the "Empress of Ireland" was damaged by collision with another ship and went to the bottom near the mouth of the St. Lawrence river. At that point the river rises and falls at each tide to a normal measure of 16 feet, but under some conditions this change of depth is even

greater. As a result, the currents are very swift when the tide is either ebbing or on the flood, and at each change of tide there is a brief period, of only about thirty minutes, called the "slack," when the waters are substantially currentless or still. Salvage operations could be carried on only for these short periods, and even then the state of the weather determined whether or not work could be done at all below the surface. But there were other circumstances that hampered. The river at the point of the catastrophe is very deep; the waters near the bottom are muddy and well-nigh inky black, while the temperature was as low as 40 degrees Fahrenheit. These conditions made the divers' tasks not only difficult but extremely dangerous. However, india rubber, combined with engineering cunning, won out just the same.

When the "Empress of Ireland" went to the bottom after



DRYING THE DIVER'S DRESS

her collision with the "Storstad," she heeled over and rested on her wounded side. There was nothing above the surface to indicate how the ship lay in relation to the course of the river, nor, indeed, anything to show exactly where she rested. The initial task of the Canadian Salvage Association was to find out just where the ship was, and her exact position. This was not easy. The diver who first went down just managed to catch a projection on the craft's upturned bilge, and then, losing his hold, dropped to nearly 130 feet, where he hung without being able to touch anything. The red paint which discolored his suit told that he had touched the ship's bottom, and his description of the projection to which he had clung revealed its identity as one of the bilge keels. That, however, was only one point of contact, and the next time the diver went down he landed on the hull, just inside of the rail. After that, successive descents enabled the salvors to make certain of the vessel's position.

The Canadian government wished to secure the mail matter; certain underwriters wanted to get the silver bullion and specie, and the liner's owners, the Canadian Pacific Railway, were especially anxious to recover the bodies of the



TWO DIVING OUTFITS, WITH CABLES, HOSE, ETC.

passengers. The postal pouches, the treasure and most of the bodies were inside of the ill-fated steamer. It is an extremely hazardous thing to enter a sunken ship, especially if she is in deep and dark waters, but the problem was made still harder before the salvors could begin. The cargo shifted, and this tended to bring the ship back towards an upright position, but still left her heeled over at a sharp angle, while the soft mud of the river bottom yielded and the liner sank deeply into it.

The diagram accompanying this article shows the path the divers took in reaching the ship's interior. The steerage was on the same deck with the mail room and strong room—the latter containing the bullion and the purser's safe. It was out of the question to reach the strong room by any of the regular hatchways or other hull openings, but the salvors found another route available, provided the side-plating of the ship could be cut through at a certain point—that point having no outward mark other than that of an air port, and that air port merely one among scores of others. To find this particular air port it was necessary for the divers to work from both ends toward the center and to count carefully each glazed opening until they had identified the desired deadlight. This was a difficult job, because they had to keep their footing on the slippery slanting side of the liner. Finally, after some days of groping, they reached their goal. They got into the sunken vessel by the hole which they cut at a point where the internal arrangement of the craft made it fairly easy to reach the liner's strong room. The opening was made by drilling a lot of holes with a pneumatic tool fed with compressed air through an armored rubber hose reaching to the surface, and despite the fact that the divers had an awkward place to stand on the slanting side of the vessel, still the drill did its work so well that the passage was cut nearly as quickly down in that inky depth as could ordinarily be done in the open air. Of course they did not do this blindly, having submarine lamps to help them. From the first, the question of lights in that perilous work was one of great importance, but it was particularly desirable that the electric lamp should not require a cable which might get tangled. An electric hand lamp was adopted, but it was necessary to adapt it for the special conditions. Accordingly, the lamp was made water-tight by a piece of motorcycle tire, closed at one end by rubber cement and slipped over the lamp. The

end not sealed hugged the glass, and with the aid of some rubber tape a tight joint was made which kept out the water without interfering with the illumination. At their greatest depth, i. e., in the strong room, the divers worked 160 feet below the surface, and yet the lamps were quite equal to the hydrostatic pressure encountered.

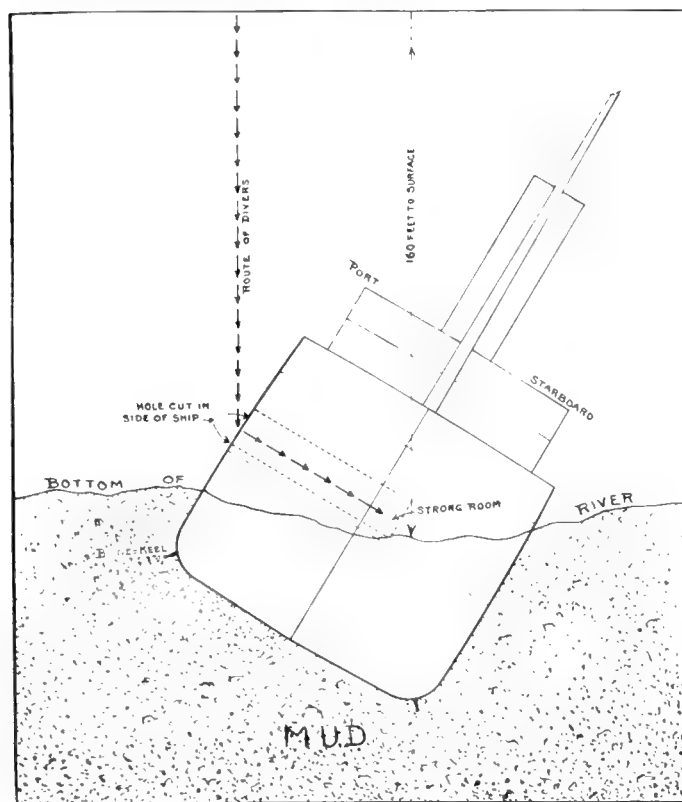
But before the men were allowed to go inside of the ship to save the treasure and to recover the mail pouches, the flanking doorways to the six staterooms were sealed and the lengthwise passage blocked off by two bulkheads in order to give a straighter route and one freed, to just that extent, of pitfalls into which the divers might turn should they become confused. Another precaution was taken to guard against accidents. The chief engineer had made a pasteboard model of the immediate path to the room holding the bullion and the adjoining compartment containing the mail matter, and the divers were drilled with this miniature until they could describe with their eyes shut just which way they would have to turn in order to get out of the vessel should their lights fail them at any point.

Because of the coldness of the water the divers were soon incapacitated by their hands becoming numb. Ordinarily the hands are the only parts of an under-water worker that are not covered, and the reason for this is that the diver depends largely upon his sense of touch to guide him where he can not see. It was plain that something would have to be done, and Yankee inventiveness suggested rubber gloves. The English seamen divers and the Canadians objected at first, but finally thin but durable American rubber gloves were found and these, while protecting their hands, did not interfere with a nice sense of touch. The importance of the part played by these coverings can be gathered from the fact that the twelve expert divers engaged used up quite a hundred pairs before their services were ended.

Owing to the hazardous nature of the work the divers always descended in pairs, so that one could help the other in case of need and both could use their united efforts the better. To further facilitate their joint labors a very recent development of a submarine telephone system was employed, and this was somewhat improved by modifications suggested by one of the American engineers. Usually divers communicate with the surface by means of signals in the form of pulls upon the connecting lifeline or by tapping so many times on the helmet of a companion worker. This code is limited. It was vitally necessary that the men should be able to communicate vocally with one another so that their efforts would tell most with the least physical stress, for in very deep submergences a man can really do but little muscular work. Therefore each diver had a telephone circuit reaching to a central station on the surface salvage vessel, and the attendant there could relay at once a message from one to the other of the divers or could send them orders or give appropriate directions to assistants on the boat handling some part of the co-operating outfit, such as a hoisting engine, an air pump, etc. This telephone system—and we know the part that rubber must have played in its get-up—was one of the most useful features of the salvage plant.

One of the things discovered by the Admiralty investigators was that the prevailing hand pumps did not furnish enough air to the diver when working at depths of 130 feet and more. The manufacturers set about improving the pumps, but the salvors soon found the burden an extremely heavy one when trying to send air enough down to the six divers working on the sunken vessel. It took four men to crank each pump and but a short time was needful to exhaust them, and four more fresh men had to be ready to take up the grinding job in order that there should be no halt in the air supply. A break-down, even though brief, might prove fatal to the divers below; and here, again, American ingenuity filled the breach.

Our own naval authorities had made some experiments, and they found that compressed air could be stowed in tanks and thence fed directly to the submerged workers toiling at best in water of moderate depths. The problem for the salvage engineers in the present instance was to amplify this and to make it equal to the demands of several divers operating between 140 and 160 feet below the surface of the tide. Therefore, on the schooner "Marie Josephine," the salvors' floating base, two big air tanks were installed, and then steam-driven compressors, instead of hand-propelled pumps, were utilized to store the air in sufficient measure to meet liberally every condition with a generous surplus. The armored rubber air hose was attached to these tanks with suitable intervening valves which could be manipulated to feed the air to the divers at just the pressures indicated by suitably sensitive gages. One man at a valve with two outlets sufficed to attend a couple of divers, and this not only simplified operations, but added greatly to the security of the men.



POSITION OF "EMPERESS OF IRELAND" AND ROUTE BY WHICH DIVERS ENTERED HULL.

The removal of the mail pouches was not a particularly troublesome work, and the recovery of the bars of silver bullion was only a little bit harder, because each ingot was handled separately and was dragged out of the strong hold by means of a hoist rigged on the attending surface vessel. A canvas bag with a framework of bar steel was fashioned, and a hole in the bottom of this bag permitted the water to escape freely. One by one the ingots were placed in this receptacle and guided by the divers out of the strong room and thence through the two succeeding doorways into the straight passage leading outward to the hole cut in the vessel's side. The pull on the connecting line was nicely regulated by telephone directions dispatched by the divers. The really serious undertaking was that involved in getting out the purser's safe, which had been set into a special niche built for it in the corner of the strong room. The divers had to dislodge this strong box by means of crowbars and then

to pass around it a chain sling to which was attached a small but strong wire rope. This line was then led carefully around pulleys at each sharp turn and provision was made for securing or "stopping" the cable at frequent intervals as the safe was steered along its round-about path and over and up the sharply slanting and slippery deck of the steamer. It was needful that the pull exerted by the hoisting engine should be uniform, lest a sudden jerk part the wire rope and endanger the lives of the divers piloting the safe. If that cable had snapped and cut the rubber suit of either of the men it would probably have meant certain death, while to have been caught or squeezed by the runaway safe would have proved equally disastrous. None of these mishaps occurred, thanks to the exhaustive preparations made and the thoroughness and the skill with which every manoeuvre was carried out.

In kindred undertakings at lesser depths the practice has been to blast away the ship's structure intervening between the free water and the objective—this, assuming that the water be clear enough for light to come down from the sun. In the present case the depths of the St. Lawrence were very dark, and to have blasted the steel work would have produced shattered plates and tangled frames that would all too easily have either caught or cut the air hose and the divers' life-lines. So, too, explosions of this sort might have desecrated the bodies of imprisoned passengers. Therefore, the salvors set for themselves a harder task, a finer job of under-water engineering; but, thanks to these preparations, they accomplished all that they set out to do. Not only were the safe, the bullion and the mail pouches salvaged, but 170-odd bodies were recovered.

These salvage operations on the sunken "Empress of Ireland" stand without a parallel in the art of under-water work, and but for the agency of india rubber in its various applications this masterly achievement would have been out of the question.

THE RUBBER GROWERS' ASSOCIATION AND THE WAR.

The Council of the Rubber Growers' Association, of London, has approved a proposal to raise funds through the membership of the association for the purpose of presenting to the War Department a motor ambulance for the use, preferentially, of the Indian Expeditionary Force; such an offer having been made and gratefully accepted. A committee was appointed to carry out the necessary details, composed of—John McEwan, president of the association; A. Bethune and H. K. Rutherford, former presidents; Sir John Anderson, head of the firm of Guthrie & Co., of Singapore; T. Cuthbertson, the Honorable Everard Fielding, E. L. Hamilton, John A. Roberts and W. Shakespeare. If sufficient donations are received it is proposed to maintain a chauffeur for the car and to provide running expenses.

It is proposed also, out of the suggested funds, to present to the war ship "Sydney" of the Australian navy, a life saving collar made from plantation rubber for each member of the personnel of that ship, in recognition of her service to British commerce in destroying the German cruiser "Emden."

A BRITISH FIRM IN THE MARKET FOR EBONITE OR VULCANITE.

Kemp's Vulcanizing Co., Limited, of 19 Hardman street, Manchester, England, is desirous of securing supplies of ebonite or vulcanite goods, which in the past they have purchased in large quantities from Germany, and would be glad to get in touch with American manufacturers of this class of goods.

It is to be noted that many American rubber manufacturers who had adopted plantation rubber in certain special compounds are turning to coarse Para, Ceara and Centrals. They took to the plantation slowly, and will doubtless go back to it with equal slowness.

New Rubber Goods in the Market.

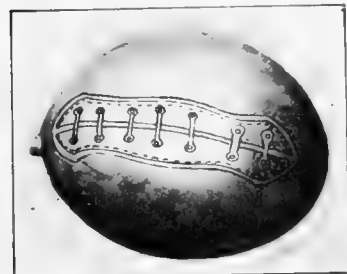
RUBBER TOYS AND NOVELTIES.

THE fact that many of the toy factories which have in the past supplied the American market with toys have been inactive for some time owing to the war has had no noticeable effect upon the offerings in this line during the holiday season; and the toys of rubber have never been more varied or pleasing. The present situation in this line is one of wonderful opportunities for the toy manufacturer, buyers being not only willing but extremely anxious to examine samples produced here to replace similar lines that they are unlikely to be able to secure from abroad for some time to come.

Red rubber animals, rattles and dolls in all the accustomed styles have been sold in quantities, some enterprising retailers filling baskets with these rubber toys and selling them at prices up to \$8 per basket. The little rubber Kewpie has been extremely popular. The up-to-the-minute doll, however, is the doll that dances, and the above illustration shows a pair of dusky damsels who, beside being expert in the execution of buck and wing dances,

can also be induced to give exhibitions of the fox trot and other late bewildering combinations of movements. The dolls are twins, attached by an elastic cord encased in ribbon, and when dangled over the finger their gyrations and droll expressions are extremely amusing. Another funny little new doll is "Billy Bumper." And he can be bumped around with perfect safety, for he is composed largely of rubber, his body consisting of a rubber ball, his head and feet being made of cotton.

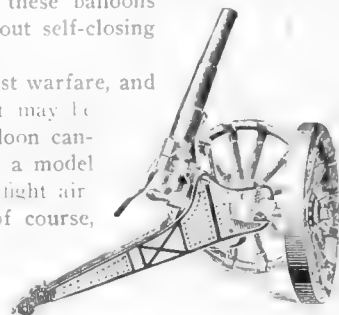
Many new forms of toy balloons have been shown this season. The charm of this form of amusement knows no season, however, and has as strong a hold on grown-ups as on the younger members of the family, for no New Year's Eve celebration is complete without its toy balloon souvenirs. The bagpipe balloon is a favorite for occasions where noise is considered desirable. It has a wood mouthpiece and trumpet on which tunes can be played in imitation of the Scotch bagpipes. Another novelty is the dying pig. This balloon when inflated resembles the accompanying illustration, and as the air escapes the pig squeals, until its final collapse. Then there is the balloon



made in two colors, for either air or gas, and known as the "Tango" balloon, the crying balloon, the balloon that whistles and the balloon made to resemble a football, including the side

lacing effect. Still another style is made torpedo shape, being capable of inflation to a length of 14 inches. This style can be had with stick and pom-pom attachments, or with a string at one end and a pin wheel attached to a cord inserted in the other end, so that when the balloon is drawn through the air the pin wheel revolves. Most of these balloons can be had either with or without self-closing valves.

Torpedoes and airships suggest warfare, and that attacks by the latter craft may be rendered ineffective a new balloon cannon has been devised. This is a model of the Krupp gun designed to fight air ships. This military toy is, of course, made of metal, but its ammunition consists of rubber plugs. Coast guns, Howitzers and field artillery consume large quantities of these rubber plugs, rubber projectiles and rubber balls.



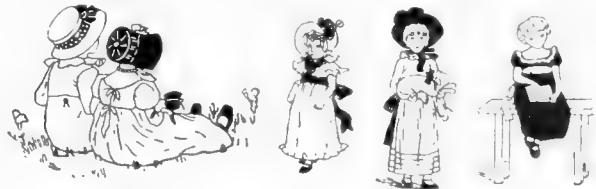
The rubber stamp manufacturers have also contributed to the amusement and education of the small members of the family by supplying rubber stamps, sets of which, at 25 cents for 12 stamps, will turn out endless numbers of soldiers and sailors, animals and hunters, wild west and circus performers, Brownies and Teddy bears, quaint and dainty little Kate Greenaways, etc., etc.

The toy departments display so many toys in which rubber cord is used—if to a small extent in individual instances—as to



RUBBER STAMP SOLDIERS AND SAILORS

make the supply of this article to the toy makers an interesting possibility. For instance, it would be interesting to know the quantity of cord necessary to adjust the arms and legs of a holiday supply of dolls; to equip the aeroplanes and other flying craft, which are propelled by rubber cord wound in strands; to suspend the bugs, beetles and other springy-legged figures known



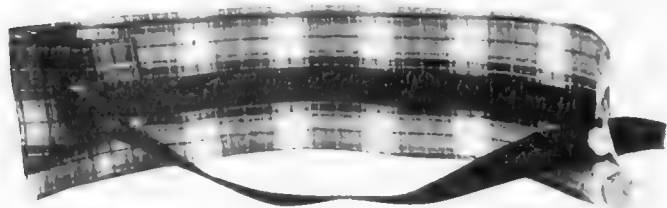
KATE GREENAWAYS.

as Japanese trembling novelties, to serve as joints for the wooden circus toys, animals and clowns, and to propel the torpedoes that destroy bath tub battleships, etc

Miniature hot water bottles, nursing bottles, etc., have appeared, making an irresistible appeal to young mothers of baby dolls. The rubber hot water bottle is 3 inches long and 1½ inches wide, and is an exact imitation of the ordinary sized article. These novelties and the miniature atomizer with rubber bulb are made under the familiar brand "Alpha." [Parker, Stearns & Co., Brooklyn.]

AYDELOTT'S WATER BANDAGE.

This is really a hot water bottle made in the form of a broad belt. It has a removable cover, made of soft fabric, to which is attached a webbing fastener. It can therefore be worn about



any part of the body and retained as long as necessary. The bandage is also arranged so that with tubing, etc. it becomes a combination water bottle and syringe. [J. R. McCormick, The Xenia Rubber Manufacturing Co., Xenia, Ohio.]

THE "PINNACLE" TANK BULB.

Tank bulbs are today used by the hundred thousand, and poorly constructed ones cause an everlasting lot of trouble. On the other hand, a bulb properly made lasts a long time and acts perfectly. The "Pinnacle" is one of the excellent sort. The upper part of it is made of hard rubber, and is absolutely rigid; the lower part is of soft, slate colored rubber, and is a perfect valve seat. A point in the shape of the bulb is the concave slope, which allows it to come rapidly to the surface when released, thus insuring a flush of the full



capacity of the tank. The top and bottom of the bulb are welded together by the perfect lock-grip coupling. [The B. F. Goodrich Co., Akron.]

THE "BESTYETTE" RUBBER APRON.

Rubber aprons in housework and in factories are becoming more and more a necessity; indeed a light weight, white, rubber apron is much more sanitary, cleanly and practical than the calico aprons of a generation ago. Where they are used in factory work they are said to be much more economical than cloth aprons, because they are easily cleaned with soap and water and need no laundering. The illustration shows a modern type called the "Bestyette," made of white rubber sheeting, light and strong, and guaranteed not to crack or peel. [N. Y. Mackintosh Co., Mamaroneck, New York.]

**HAY'S HAIR HEALTH APPLIER.**

This device is a rubber cup containing a sponge. It is for the purpose of applying liquid hair growers to the scalp. It is made particularly for one special hair grower, but can actually be used for any scalp application. It is really a very cleanly and simple method for scalp massage or for the application of anything excepting animal greases. [Philo Hay Specialties Co., Newark, New Jersey.]



A new tire called "Air in All" is being offered to the trade as a means of eliminating tire punctures by Achile Brile, of 17 West Broadway, New York.

The company is showing a new waterproof Pullman apron with pockets for toilet utensils, wonderfully convenient in traveling.

WATTERS ICE HELMET.

Ice caps, ice helmets and head coolers of a great variety are manufactured by the druggists' sundry makers the world over.

Some are made of pure rubber, some of C. I. rubber, and in a variety of colors. They are, of course, for reducing temperature in cases of fever or sunstroke. The cooling medium is either ice water or cracked ice. The Watters helmet, shown in the accompanying illustration, is a special type, consisting of a double cap which fits snugly over the head, and is tied under the chin with tapes. [The Hospital Supply Co.,



53-55 Fifth avenue, New York.]

A NEW JAR RING.

The ring in question is not the standard flat ring but round—made to fit a special jar, which has two grooves at its upper end. In sealing the jar the ring is placed in the upper groove, and when the vacuum is created by the shrinkage of the hot contents the rubber ring rolls into the lower groove and the



jar is thoroughly sealed. A point in favor of this type of jar ring is that in prying the cover off the ring is in no way injured—something that is likely to happen with the flat ring. [All-Glass Sanitary Package Co., Pittsburgh.]

RUBBER RATTLE AND TWO NEW RUBBER BALLS

Rattles are a source of great joy to the small child, and here is one combining with its possibilities in this direction the properties of a teething ring and a further value in familiarizing the child with the letters of the alphabet. This rattle is made of white rubber, designed by Mr. Eddy, of the Goodyear Rubber Co., Milwaukee, Wisconsin, who is also responsible for the alphabet and pennant rubber balls mentioned in the November number of THE INDIA RUBBER WORLD. Two other new rubber balls have been brought out by this company—the "Scouto" and the "Campo"—designed by Mr. James Suydam.

**THE PACKING WITH THE LIP.**

Crandall's Hydraulic Packing, often referred to as the Lip Packing, is fundamentally different from the ordinary packing, as on the inside it is finished at one end with a thin rubber lip which the pressure forces against the rod or plunger, thus making the joint extremely tight. And it works automatically, for the greater the pressure the tighter the packing becomes. [Crandall Packing Co., Palmyra, New York.]

"LEATHEREX."

This is the name of a new and specially prepared sole leather substitute just placed on the market by the Tyler Rubber Co., of Andover, Massachusetts, manufacturers of the famous "Tyrian" rubber articles. This new soling is supplied to the trade in sheets, graded for the most economical cutting, in various colors. Although it is absolutely waterproof, it does not draw the feet. It is claimed for this sole that it will outwear sole leather, while costing less, a claim emphasized by the makers, who also advance the statement that prices will not fluctuate but can be quoted for a long period in advance—in striking contrast to conditions in the sole leather market, where supplies and quotations are alike uncertain.

THE "ALL-WEATHER TREAD."

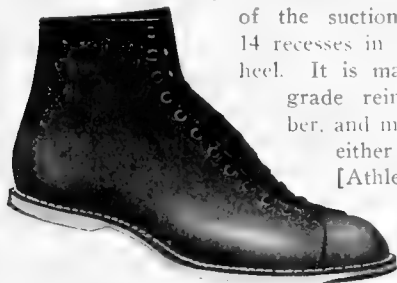
A new style in rubber soles is one for winter shoes shown in the accompanying illustration. In this the middle of the sole surface only has deep corrugations, the part containing the corrugations being $\frac{1}{4}$ inch in thickness. The shank, however, is only $\frac{9}{64}$ ths of an inch thick and carries a thin heel, the idea being to add a separate rubber heel to it. The shape of the sole is eminently modern, and it is made in sizes to suit leather shoe manufacturers. [The Good-year Tire & Rubber Co., Akron.]

**CHILD'S RUBBER SOLE.**

The mail-order houses of necessity originate and secure many of the best novelties. A child's rubber sole, for example, is the product of such a house. This sole is simply a smooth molded sole with a broad leather tip for both toe and heel. By this combination the foot has a perfect grip whatever the weather, and the values of both leather and rubber combined. [Sears, Roebuck & Co., Chicago.]

**RUBBER SOLED BASKET BALL SHOE.**

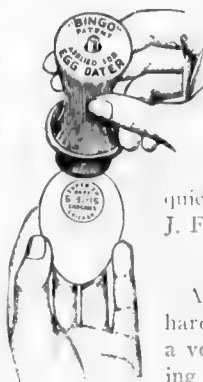
"Whatever the sport, we make the shoe" is the ambitious claim of the makers of this type of sporting shoe. Not only do they think well of their general line, but so well of this shoe that they have patented it. As far as the leather part goes, the upper is made of Kangaroo of extremely light weight. The sole is of the suction type, with 14 recesses in the sole and heel. It is made of high-grade reinforced rubber, and may be had in either red or gray. [Athletic Shoe Co., Chicago.]

**THE ARMORTRED SOLE.**

This is a new rubber sole, lighter than leather, of good wearing quality, and is not a perspiration inducer. These soles, $\frac{3}{8}$ of an inch thick, are now being worn by policemen, motormen and others whose occupation requires a heavy soled shoe that is flexible and comfortable. [The B. & R. Rubber Co., North Brookfield, Massachusetts.]

"DURABLE KOMPO."

Another substitute for the leather sole is the "Durable Kompo." These soles are guaranteed against cracking and becoming spongy, to be uniform in their composition, even wearing, light in weight and resilient. They are made in black, tan, gray and white, and are described by the makers as "the all-season sole that outwears leather." [Plymouth Rubber Co., Canton, Massachusetts.]

THE "BINGO" EGG STAMP.

It is really a very difficult thing to get a rubber stamp that will print on the surface of an egg, and yet egg buyers are, many of them, scrupulous about knowing, at least approximately, when the egg was laid. The "Bingo" egg stamp is a modern dater which is adapted to print legibly and quickly on the surface of any hen's egg. [The J. F. W. Dorman Co., Baltimore.]

THE BARNETT PUMP PEN.

A great variety of automatic fillers center about hard rubber fountain pens. What appears to be a very simple device is shown in the accompanying illustration. The barrel of the pen and the parts are of standard make, and the variety of ornamentation is also standard. The novelty of the pen lies in the pump operation.



It is very similar to a small piston syringe, and if the piston be tight there is no reason why the barrel should not fill perfectly. There is another advantage, which is that pumping water in and out through the barrel cleanses the pen and barrel effectively. [Ira Barnett, 61-69 Gold street, New York.]

STORAGE BATTERY FILLING PLUG AND HYDROMETER SYRINGE.

The double cover with filling plug of hard rubber and soft rubber gasket shown in the illustration are important parts of an "Exide" cell—the new plug and aperture particularly—as these prevent flooding the cell by controlling the amount of



water needed to replace that lost by evaporation. There is no inner gage or cover to watch while filling—just a neck of liberal diameter closed by a plug. In use one simply removes the plug, fills until the liquid rises in the neck and replaces the plug. This automatically retains the necessary air space for the expansion of the solution when the cell receives a gassing charge.

A very neat instrument for use in connection with sparking batteries is the hydrometer syringe. The parts are a glass barrel, a rubber bulb and a hydrometer terminating in a hard rubber pipette. In use, the bulb is squeezed, the pipette inserted in the vent of the cell to be tested and enough electrolyte drawn into it to float the hydrometer free of the bottom by about $\frac{1}{2}$ inch. The specific gravity reading is then taken from the scale on the glass barrel. [The Electric Storage Battery Co., Philadelphia.]



Dentists are using a jar for sterilizing their instruments. The top is fitted with a rubber ring like the ordinary preserve jar ring. [The S. S. White Dental Co., Philadelphia.]

The Scimatco laboratory tubing is "different from any other rubber tubing on the market." So says the Scientific Materials Co., Pittsburgh.

What the Rubber Chemists Are Doing.

A COMPREHENSIVE SYNTHETIC PATENT.

H. DREYFUS has received British patent No. 17,191 (1914) for a method of producing synthetic rubber, which seems to include almost everything that can be or has been done in that line. The abridgment covers four pages of the "Official Journal," while the ordinary claims require only a short paragraph.

He divides his methods into eight separate parts, as follows:

1. Olefins, di-olefines and derived products are produced by condensation of two molecules of halogen compounds, with elimination of halogen.

2. Halogen compounds are transformed by cyanides into butadiene derivatives.

3.—Aldehydes or ketones may act on the halogen derivatives of unsaturated hydrocarbons.

4.—Acetylene is transformed into acetaldehyde by water.

5.—Sodium may act on the halogenides.

6.—Polyhydrox compounds are transformed into furfurans.

7.—The above are reduced and water eliminated.

8.—Glycerine esters, etc., with at least one double bond—preferably two—are transformed into di-hydroxy derivatives by adding two hydroxyls to double bonds.

The above are converted into caoutchouc-like products by condensing agents, and about everything mentioned in Bernstein is claimed as a condensing agent. The product is to be vulcanized by the usual methods.

A UNITED STATES PATENT USING PONTIANAK.

United States patent No. 1,110,765, issued to J. W. Frank, is for a composition for painting plaster with ponti rubber and resin and Indian copal dissolved in alcohol or acetone, after removing the saponifiable matter with alkali. Attention may be called to the fact that a few years ago Carleton Ellis obtained a pretty comprehensive patent on the use of pontianak resin in cement coatings, the claims being based on the property of pontianak resin to resist the action of alkalies and be unsaponifiable. Attention was called to this property several years ago in this journal in articles describing deresinating processes.

ACETIC ACID FOR COAGULATING PLANTATION LATEX.

Owing to the disarrangement of business the Eastern plantations are now suffering from a scarcity of acetic acid for coagulating latex, and there seems to be considerable discussion as to how supplies are to be obtained.

The Germans have been writing on this subject and state that the world's supply of this acid is known to be produced in Germany and Austria.

It may be mentioned that one-half the supply of acetate of lime from which this acid is made is furnished by the American wood distillers, and that we shipped 80,000,000 pounds of acetate of lime to Europe in 1912, containing about 60 per cent acid. The United States has a number of large chemical companies which make acetic acid of all grades.

It has been calculated that the 50,000,000 pounds of plantation rubber will require 150,000 pounds of acetic acid for coagulating the latex. This would require 250,000 pounds of acetate, worth in New York \$5,000; and the acid in the East would be worth probably about \$15,000.

The possibility has been suggested of setting up wood distillation works, to be conducted along European lines, with the production of the various by-products, such as alcohol, in addition to the acid.

The Eastern technical journals state that Mr. Campbell, of Ceylon, who is attached to the Department of Agriculture,

has experimented with a small retort and has distilled some cocoanut shells and produced a few pounds of acid, and Mr. Kelway Bamber, of Peradeniya, has also interested himself in the subject. Acetic acid is said to be manufactured in Colombo on a small scale.

It may be said without fear of contradiction that no complete wood distillation plant could be installed for the production of such a small amount of acid as is required by all the plantations, as the smallest American works would have ten times this capacity.

It is quite possible that the proper solution of this problem would be the installation of a pair of retorts as used in the United States, which would handle about 6,000 pounds of cord wood daily and produce about 3,000 pounds of pyroligneous acid, containing, say, about 6 per cent. acetic acid. This should have all the power of acetic acid as a coagulant, and, in addition, the tarry matters present should have the same preservative effect as in the smoking of Para. In fact this "liquid smoke" should produce "smoked sheet."

The acid would, of course, be dilute as compared with the glacial acetic acid now used, but as it would be produced near the point of consumption the transportation problem would not be very serious.

One thing in connection with acetic acid used for coagulation must be borne in mind, which is that it has been found that some acid contains a small quantity of copper dissolved from the copper condensers, and that this copper makes it unsuited for coagulation, as it produces a slimy coagulation and the product is useless for any purpose.

This means that the final condensation must be made in glass, pottery ware or lead. This would prevent the possibility of copper in the acid. Acetic acid produced from alcohol has also been suggested, but this is merely vinegar and is necessarily quite weak, as ordinary vinegar contains only about 4 per cent. acetic acid.

PROPERTIES OF SOLID DI-ELECTRICS.

Paper presented before the Washington Academy of Sciences, giving results of experiments on the surface resistivity and the volume resistivity of di-electrics.

The volume resistivity is the resistance in ohms between two faces of a centimeter cube.

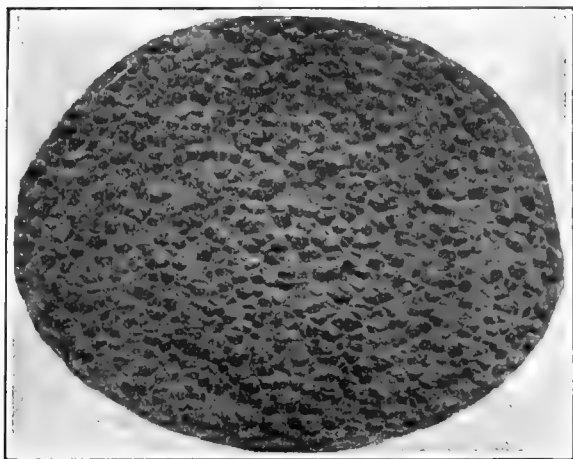
The surface resistivity is the resistance between two opposite edges of a centimeter square of the surface film which is deposited on the material.

The following table gives the volume resistivity of a few of the substances tested:

Special paraffine	over 5,000 x 10.15
Ceresin	over 5,000 x 10.15
Hard rubber	1,000 x 10.15
Clear mica	200 x 10.15
Sulphur	100 x 10.15
G. E., No. 15R	40 x 10.15
Halowax, No. 5,055B	20 x 10.15
Bakelite, No. 558	20 x 10.15
Shellac	10 x 10.15
Sealing wax	8 x 10.15
Moulded mica	1 x 10.15
Unglazed porcelain	300 x 10.12
German glass	50 x 10.12
Platt	20 x 10.12
Opal glass	1 x 10.12
Black condensite	40 x 10.9
White celluloid	20 x 10.9
White gallalith	10 x 10.9
Vermont marble	1 x 10.9
Ivory	300 x 10.6
Slate	100 x 10.6

Caoutchouc Mousse, or rubber foam, described lately in the "Scientific American," is really sponge rubber very much sponged. It is a French invention and is based on the fact of the increase of the solubility of gases with the increase of pressure.

To make it, rubber, softened by massing and partially vul-



RUBBER FOAM AS IT APPEARS IN THE MICROSCOPE.

canized, is enclosed in a steel tube with nitrogen at a pressure of 3,000 to 4,000 atmospheres. The gas dissolves the softened rubber and, when the tube is opened, expands it to four or five times its former volume, when it solidifies. It is said to be of use for a variety of purposes where any very light sponge rubber could be used.

NEW PROCESS OF LATEX COAGULATION.

According to the claims of the patent taken out in Brazil by Professor Heinrich Coloseus, of Berlin, it has been recognized of late years that the quality of rubber is subject to wide variations, in accordance with the mode of its extraction and coagulation. Considerable progress has been realized in this matter, but without a thoroughly satisfactory process having been discovered.

In addition to the methods of smoking usual in Brazil, coagulation has been effected by one or the other of two systems. By the first, the rubber and the bodies which accompany it are precipitated by the addition to the latex of various acids, while by the second substances are added which precipitate or transform into salts the solid bodies suspended in the rubber latex.

The disadvantage of all these processes is that they precipitate albuminous substances at the same time as the rubber, and in such a form that they rapidly decompose, and lead to the decomposition of the rubber. Under the new patent the albuminous substances are eliminated in such a shape that their durable stability is assured.

For this purpose an alkali is first added to the latex, in particular hydrate of potassium or of sodium, or of any other substance with alkaline reaction, working with the formation of a soluble salt on the albuminous and other bodies which accompany the rubber. If necessary the reaction can be completed by heat. By the addition of heavy ferrous or alkaline-ferrous salts, hydrates or oxides, or of mixtures of these substances, the soluble salts of the albuminous or similar substances are transformed into compounds difficult or impossible to dissolve in water. The separation of the solid bodies takes place either immediately, after a protracted rest, or after heating. In the rubber as separated are then found the albumen or the albuminous substances, or the saponifiable resins in the form of their insoluble salts.

It is stated that the products obtained by the experiments made on this system have been found of excellent quality.

PHYSICAL TESTS OF RUBBER.

IN the "Bulletin de l'Office Colonial," Paris, Messrs. Heim and Chêneveau have lately dealt with the methods of physical tests of rubber in connection with their commercial value, emphasizing the following points:

I. The possibility of differentiating two rubbers by numbers indicating their industrial value. In the present state of knowledge, purely chemical determinations will not solve the problem, which calls for mechanical or physical tests.

II. A rapid test of the crude material would simplify matters a good deal.

The physical tests include: Extensibility with constantly increasing loads; elasticity of traction, cycle of hysteresis and permanent elasticity; combined test of extensibility and elasticity "nerve"; successive cycles of hysteresis; extensibility with constant charge; varying length of charge; tenacity; compression with progressively increasing loads; elasticity of compression; extreme compression; friction or abrasion and hardness.

III. ELECTRIC TESTS: Resistance of insulation; resistance; dielectric constant; electrostatic rigidity.

IV. VARIOUS PHYSICAL TESTS: Action of heat; action of light—coloration, absorption; solubility; viscosity of rubber solutions; adhesion; absorption and diffusing of gases.

V. Determinations have been tried of the viscosity of raw material dissolved in appropriate solvents. These tests consisted in dissolving the rubber in benzine and running off the solution through a capillary tube. Tests of adhesion are often effected by dissolving the rubber in oil of naphtha, but are of no importance except for rubbers used in making waterproof fabrics. Other tests are those of the absorption of gas, only of interest to the aeronautic industry, as well as heating the rubber up to 100 degs. and noting the time it takes to become tacky.

VI. For the establishment of a general and useful test it has been found necessary to return to those long used for vulcanized rubber. Plantation Para, it is added, tears easily, its homogeneousness being only apparent. A test of this character only appears possible with a homogeneous layer of rubber of regular thickness.

VII. In tests of vulcanized rubber, mixed with sulphur, hot vulcanization seems to give better results than the cold process. The proportion of sulphur must not be too small nor too large.

VIII. For a long time traction tests have been made with the traction machine or dynamometer for defining tenacity and extensibility. Test pieces have generally the shape of prismatic bars, fixed at their extremities to the jaws of the machine. Two lines traced on the margin of the bar serve to indicate the extension to the breaking point. For this work it is found that moulded test pieces are preferable to cut ones.

Laws of more or less complicated nature, determined by the successive extensions and contractions of test pieces, afford a certain test of rubber, defining its "cyclic fatigue"; the rubber assuming a more stable condition, which, however, is not easily defined.

It may be concluded that the test of extensibility alone is insufficient, the addition of the test of elasticity being required to bring out the other fundamental qualities of the rubber. The larger the number of different qualities to be defined the more exactness will there be in the determination of the various grades of rubber.

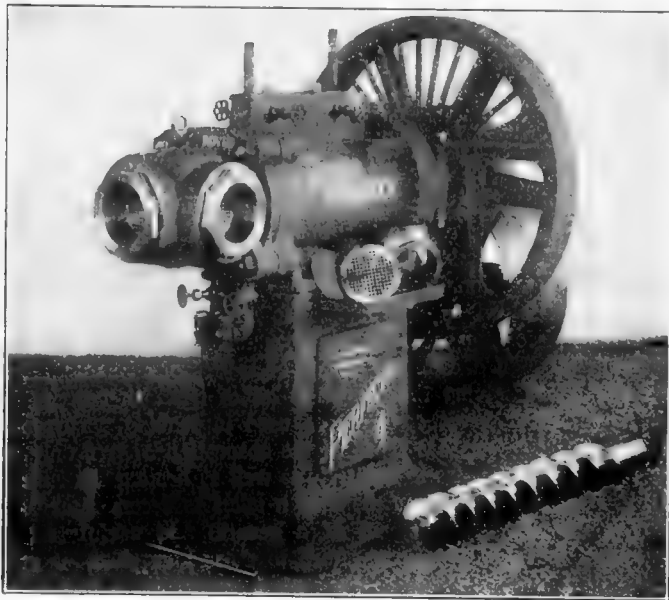
A point to be noted is that when rubber has been stretched under a continuous load, applied gradually or once for all, the test piece increases in length.

IX. The most precise and rational course is that of comparing under identical conditions the technical properties of the rubber to be tested with those of a standard sample, both having been vulcanized without any other weighting substance than sulphur.

New Machines and Appliances.

ROYLE THREE-WAY HEAD STRAINING MACHINE.

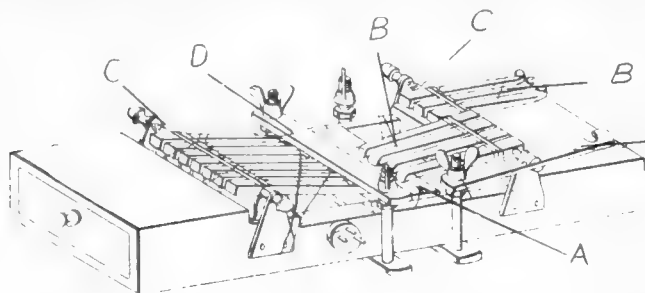
THE illustration shows a new reclaiming strainer designed for heavy work, and plenty of it. The body of the machine is supported on a broad, square base. It is chambered for heating or cooling, and is accurately bored to receive the large and powerful stock worm. This has ample thrust bearings, is driven by a belt and cut spur gearing, and is capable of handling large quantities of stock. The feed hoppers are large and specially constructed for capacity. The three-way head has heating or cooling chambers, and the holes in the plates are



square instead of round. This feature is a decided improvement in straining machines where capacity is desired. The usual wire gauze strainers can be removed for cleaning by unscrewing the octagonal headed bushings with the special socket wrench provided for that purpose. [John Royle & Sons, Paterson, N. J.]

SPRIGG'S MACHINE FOR REPAIRING RUBBER GLOVES.

THIS machine is designed for repairing glove tips. Fourteen finger trees are arranged seven on each side of an electrically heated vulcanizing platen. They are pivoted on rods and the ends that rest on the platen are flattened. The finger



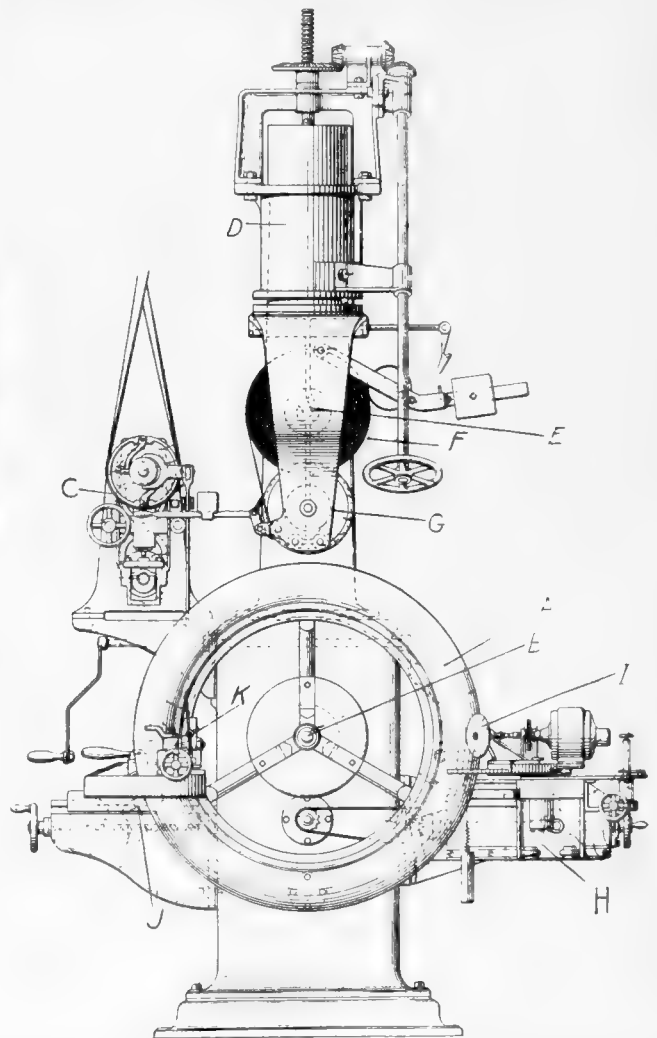
A—Vulcanizing Platen. B—Finger Trees. C—Finger Rods. D—Clamps.

of a glove is drawn over a tree, and the hole covered with a small piece of repair stock. This part is then located on the flattened portion of the tree, after which it is brought down in

position on the platen, and when each finger and tree has been similarly treated they are all clamped down. A thermometer attached to the platen indicates the degree of heat.

THROPP-DELASKI TIRE MAKING MACHINE.

THE illustration is a front view showing a tire core mounted on a spider revolved by a driving shaft. This shaft extends through the housing, has reverse gearing and is connected to a variable speed device so that the core is driven at various speeds to the right or left. A cylindrical head slides in a cylinder of fabric in a frame. It is moved vertically by a screw, bevel gearing and an inclined shaft operated by a hand wheel.



A—Core. B—Driving Shaft. C—Variable Speed Device. D—Cylindrical Head. E—Fabric Frame. F—Fabric. G—Friction Roller. H—Sliding Carriage. I—Forming Discs. J—Sliding Plate. K—Trimming Knives.

The fabric, cut in bias lengths, is passed under a guide roller over the wooden friction roller, under another guide roller, and is then pressed firmly on the periphery of the core. At the same time the interposed wrapper is wound on a take-up roller.

Mounted on a sliding carriage are two plates that swing in opposite directions in a curve equal to the periphery of the core. These support the two motor driven forming discs.

The various layers of fabric are laid on the core and then stretched and formed down by these discs. The bead rings are

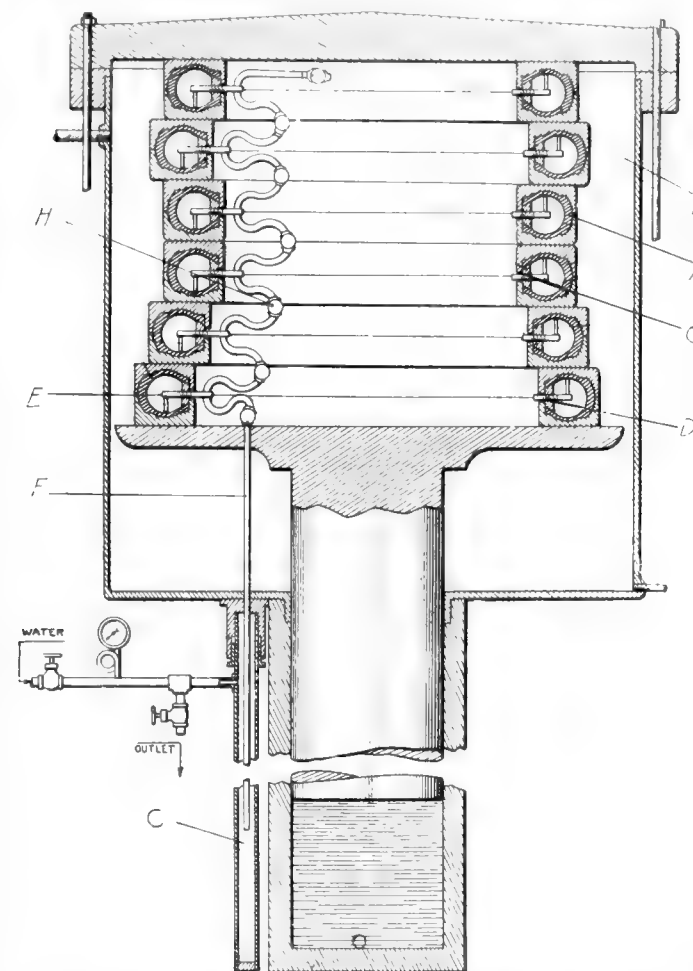
placed on the casing and the bead cores pressed in position, after which the rings are removed and fabric stretched over the cores.

A sliding plate on the left of the core supports a hook-shaped swinging arm carrying two trimming knives which trim the edges of the casing. The tire and core are then removed from the machine and placed in a mold or wrapped for vulcanization.

McLEOD'S TIRE MOLDS AND VULCANIZER PRESS.

THE invention illustrated comprises a live steam chamber, a hydraulic press and tire molds with connections so that water under pressure is admitted to the interior of the tire casing during vulcanization.

In use a tire is placed in the mold with the annular ring between its edges, forming a tight joint. Through this ring extends a valve which automatically discharges water or admits steam to the interior of the tire. The ring also supports a nozzle that delivers water under pressure to the interior of the tire. The mold is then placed on the ram platen and connected to the water inlet, and the succeeding molds are stacked and connected



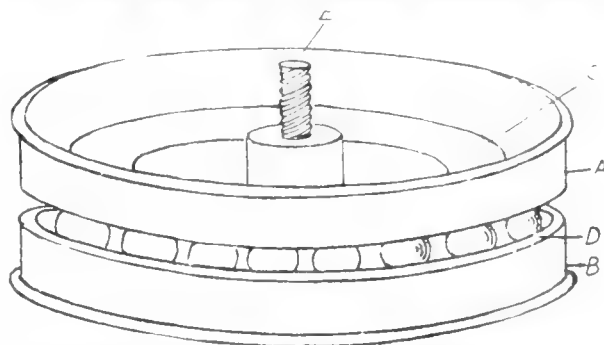
A—Tire. B—Two Part Mold. C—Annular Ring. D—Automatic Valve. E—Water Nozzle. F—Water Inlet Pipe. G—Water Receiver. H—Flexible Coupling.

together by flexible pipes and couplings. The press is then closed and pressure applied to the molds. Water under pressure is admitted to the interior of the tires, stretching the fabric, while the air is discharged through the automatic valve. Live steam is turned into the press chamber. This heats the water in the molds, and the tire is then cured both inside and out. When the cure is complete, steam from the molds is exhausted at the outlet pipe assisted by the steam pressure in the heater acting through the automatic valve.

In another patent the molds are first filled with water applied under pressure to the interior of the tire. They are then suspended from a track in a horizontal vulcanizer and connected by flexible hose and couplings to a manifold and drain pipe. The subsequent operations are practically the same as just described.

CRESWICK'S DEVICE FOR PAINTING GOLF BALLS.

THE principal features are two wood or metal discs with circular grooves lined with rubber, and when placed one above the other they form a ball race. The upper disc is re-



A—Upper Disc. B—Lower Disc. C—Tire Rubber Lined Groove. D—Lower Rubber Lined Groove. E—Spindle. F—Vertical Spindle.

volved and the lower is stationary. Paint is applied to the grooves and the golf balls are placed in the lower disc groove. The upper disc groove is then brought down in contact with the balls. When the upper disc is revolved the balls are rotated, distributing a coat of paint evenly over the surfaces.

DOUGHTY'S TIRE MAKING MACHINES.

HENRY J. DOUGHTY, who is well known in the rubber industry, especially as a designer of tire and footwear machinery, has recently been granted several patents on a series of machines and a process for making pneumatic tires. What he claims specifically is that he has evolved the first continuous process for making and curing pneumatic tires by machinery.

In the first place, a special loom weaves a strip of fabric, loose in the middle and heavy at the sides. This is woven on a slight curve. These strips are frictioned on a calender that has concave and convex rolls. From the calender the strip is lead automatically to the tire core, around which it is wound—once for single, twice for double, three times for triple plies, etc. While this winding goes on strips are applied for beads, etc. The tire tread is then added and the tire placed in a collapsible tread press that cures it some twenty minutes. Tires have been tested in Providence, where his plant is located, and have stood up with the best. In the illustrations Fig 1 shows two views of the calender, that on the left being a front elevation, and that on the right a plan view showing the machine in connection with the tire core, on which the frictioned strip is wound as it leaves the rolls. The middle roll is convex while the upper and lower rolls are concave, the contour being such as to shape the strip passing through. The middle roll is driven faster than the others to friction the rubber into the fabric.

Referring to the right-hand drawing, the fabric D is fed to the calender by worm-shaped stretching rollers E, and then passes between rolls B and C, where the rubber, being fed between rolls A and B, is frictioned into it. On leaving the calender the edges of the fabric are gripped between two pairs of spiked belts, F, set at diverging angles to stretch the web threads of the strip. It is then wrapped, while still warm, on the roll-

lapsible tire core *G*, driven by the motor *H*. There are two of these cores, *G* and *I*, mounted on a frame which slides on rails *J*. When the desired thickness is built up, the strip is severed and the other core is brought in line with the calender. The covered core is then removed and another placed to receive the strip. As the covered cores are removed from the front of the calender

F and operates the toggles *G*, forcing the core segments *D* outward into the casing. At the same time the hydraulic pressure raises the ram *K* and plate *H*, and operates the toggles *I*, forcing the four segments *E* into the casing. The upward movement of plate *H* releases guide rods *N* and allows plate *O* to be raised against stop screws *P*. This forces the parts of the mold around the casing, while steam for vulcanization is admitted through pipes *Q*, *R* and *S*. When the cure is complete the rams are lowered, which opens the mold and withdraws the core segments from the tire so that it may be removed from the ring *C*.

OTHER DEVICES.

THORDARSON'S PAPER STRIP CUTTER.—This is a machine that receives the paper, or thin material of a like nature, from the roll and cuts it into strips which it winds compactly on reels. Each cutter is circular and grooved, and has a hub. The edges of the cutters are shearing edges. The hubs are formed with grooved rubber rings. The two gangs of cutters are placed on parallel shafts with the cutting edges of one bearing against the rubber surface of the

opposite cutter. When the material passes between these revolving cutters it is cut into strips. These are wound on the reels under tension applied to the swinging reel frame by weights.

CAMERON CLOTH SLITTING MACHINE.—This prevents distortion of the material being cut by score cutters and a surface rewind roller which pulls with equal force on all the slit sections. A web tension roller smooths out the wrinkles in the cloth before it is slit by the cutters, and supplementary knives extend between the slit sections for cutting unsevered threads.

ERICKSON'S CHANNEL CEMENTING MACHINE.—The object of this invention is to control the cement feed and properly apply it. The cement tank, mounted on a stand, is connected to a belt driven stock worm that forces cement through a vertical revolving brush. There is a vertical revolving guide adjacent to the brush. This is normally held down below the brush by a spring. In operation the work is brought up against the bottom of the guide, lifting it and bringing the flap between it and the brush which applies the cement.

ADAMS INSULATED WIRE WINDING MACHINE.—This machine, which has been assigned to the Western Electric Co., winds various sizes of wire on spools of different lengths. The spool is supported on an arbor rotated by a motor. A wire guide is attached to a carriage that moves on a track. A back carriage also travels on a parallel track, and is moved to the right or left by an endless belt. These two carriages are united by a slotted lever that swings on a pivot in a horizontal plane. When the back carriage moves to the right or left the front carriage and guide move in the opposite direction, laying the wire evenly on the revolving spool. The carriage is reversed automatically by magnets on the back carriage engaging the endless belt. When the winding is complete the machine stops.

NEWTON'S DEVICE FOR TESTING AIR BRAKE HOSE.—This consists of an air valve and ports operating a piston that reciprocates in a short cylinder. A short piston rod passes through a stuffing box in the valve body, and supports an expanding clamp on its outer end. This is enclosed in a circular bushing attached to the valve body which has inner cam surfaces engaging movable fingers of the expanding clamp. One end of the hose to be tested is inserted in the clamp and air is admitted to the piston. This moves the clamp and test piece forward, and the fingers are forced together by the cams, firmly gripping the hose. At the same time air for testing is admitted through a small opening in the piston head and rod. When the test is completed the valve is opened and the hose is automatically removed from the coupling.

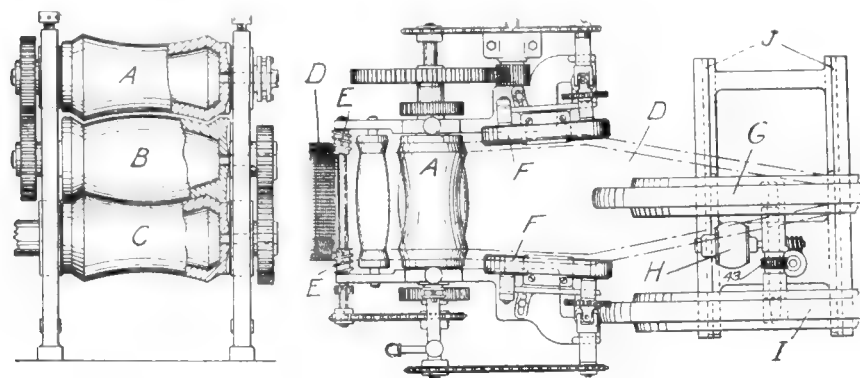


FIG. 1.—DOUGHTY'S FRICTION CALENDER FOR TIRE FABRIC.

they are placed on other frames for applying the treads, after which the tires are molded and vulcanized in the press shown in Fig. 2.

This is a hydraulic press, a three-part mold and a collapsible core of eight segments. The mold consists of an upper platen *A*

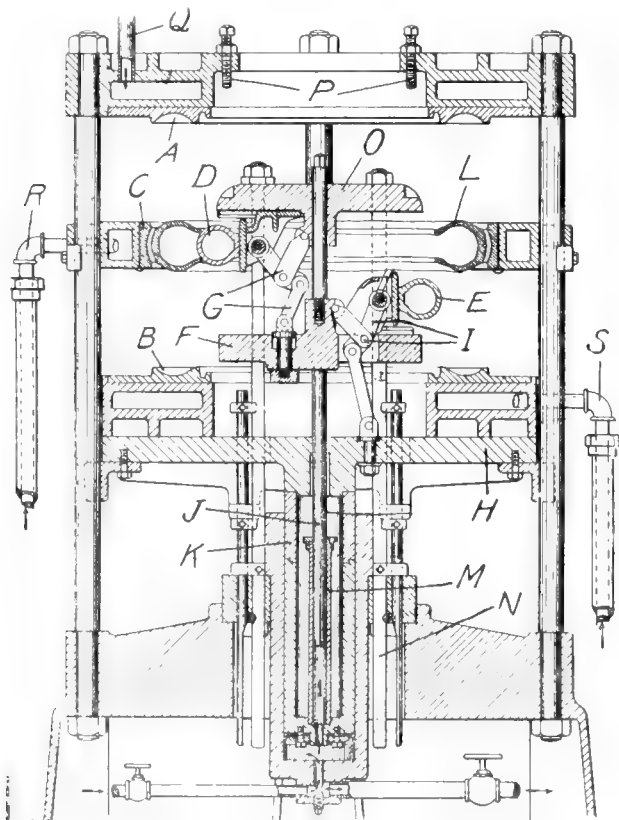


FIG. 2.—DOUGHTY'S COLLAPSIBLE-CORE VULCANIZING PRESS.

and a lower platen *B* for the sides of the tire, and a ring *C* for the tread, all chambered for steam. The core is made up of four segments *D* and four segments *E*, the former being connected with a plate *F* by toggles *G*, and the latter with the plate *H* by toggles *I*. The plate *F* is raised and lowered by the ram *J*, while *H* is operated by the hollow ram *K*.

With the casing *L* in position in the tread mold *C*, water is admitted to the cylinder *M* to raise the ram *J*. This raises the plate

Embargo Notes.

BEGINNING with the first of December came unofficial assurances from those connected with the State Department of the United States that the rubber embargo would be lifted shortly. Sir Cecil Spring-Rice, the British Ambassador at Washington, also stated that as soon as a "satisfactory method could be arranged rubber would again be shipped to America; the arrangement to be in the form of permits issued by the British government. So far these hopes have been realized.

The embargo and the difficulties placed in the way of the re-shipment of rubber appear to be quite effective. In October, for example, re-exports amounted to only 551,093 pounds, valued at \$295,046. In shipping to Sweden, for instance, the English, French and Swedish ambassadors agree to a shipment and then it goes up to their consuls in New York for certification—without this the ships refuse it.

A cable to THE INDIA RUBBER WORLD from The Rubber Growers' Association, London, says:

"Consider possible shortly obtain permits exemption embargo provided suitable guarantees received from United States."

The Bank of England called a meeting of bankers, where it was mentioned that America had forbidden the export of gold. The comment of a leading rubber authority in London is that if rubber is to be shipped to New York from Para gold will have to be sent for it. This same authority predicts that America will enforce from neutral countries a bond guaranteeing imports to be for home consumption only.

The Para rubber factors are naturally much interested over the rubber embargo. As a consequence they look for higher prices, and an offer of two cents advance causes a demand for five.

It must not be forgotten that England is using more rubber than ever before. Rubber goods formerly made in Germany must be made at home; and German rubber goods were a big factor in England. Of the solid tires fully eighty per cent. were German made. Hard rubber was nearly all of German make. And there was cheap hose, proofing and sundries, in all of which the Germans got their full share. All of this work and more is now being done in English factories. Even "Klingerit" is being put on the market, and one English firm has applied for permission to make the trade mark its own.

The word has gone forth that English soldiers shall wear rubber boots and the footwear factories are preparing to turn out ten thousand pairs of Wellingtons a week. Light rubber surface coats are also recommended both for British and French soldiers. The former wear coats that are cravenetted, and the latter heavy overcoats that soak up water like sponges.

Add to these requirements tires for 250,000 autos used by the Allies, ground sheet and goods for domestic use, and much rubber is required.

Another reason that the British people are looking out for their own stores of rubber lies in the fact that their shipments have been so large. This in spite of the fact that France, Germany and Italy almost stopped importing rubber. Russia, for example, took 2,100 tons in October, 1914, against 423 tons in October, 1913; while the United States took 3,873 tons, against 1,453 during the same period. In other words, Great Britain exported about 50 per cent more rubber during the month of October, 1914, than during the same month in 1913.

Points of interest in the history of the rubber embargo are the story of the English government's knowledge of large quantities of crêpe bought in New York, paid for there before shipment and consigned to "a native of Sweden." At the same time came the prohibition by the United States treasury of the disclosure of information concerning export shipments until 30 days after the vessel had cleared.

English correspondents state that it is still possible for New York to secure what it requires of plantation grades by guaranteeing that it will be used for home consumption and not re-exported. This is denied by exporters in New York, who have offered to give any sort of a guarantee. They (the British) state that the government will probably pass legislation shortly covering licenses to export to neutral countries and unrestricted exports to the Allies.

The British Prime Minister, speaking of embargoes such as wool and rubber, said in a recent speech that the measures were not taken to increase British trade nor to diminish the trade of any neutral countries, but solely to prevent goods from reaching the enemy.

The Rubber Growers' Association, of London, is trying to arrange that rubber coming from Ceylon or the Malay States through England into France no longer pay import duty. At the present time France insists upon a certificate of supervision from the British Customs, guarantees, etc. So far the Foreign Office has refused to interfere and it is doubtful if the conditions will be waived.

In response to an inquiry on the part of The Rubber Growers' Association regarding the term "British Ports" and Japan, the following letter is given out from the Colonial Office:

Copy of letter from the Under Secretary of State, Colonial Office, addressed to the Secretary, Rubber Growers' Association, under date of 21st November, 1914:

"It was intended that the exception in favor of 'British Ports' from the prohibition of the exportation of rubber from Ceylon and the Straits Settlements should apply to all ports in Australia, Canada and other British possessions. This has been made clear to the Governors of Ceylon and the Straits Settlements and all British overseas governments have been asked similarly to prohibit the exportation of rubber except to British ports.

"As regards the exportation of rubber from Ceylon and the Straits Settlements to Japan, Mr. Harcourt is prepared to entertain applications from manufacturing firms in that country for permission to export rubber from Colombo and Singapore for use in their factories. The Dunlop Rubber Co. have already been granted permission to ship to Japan for use in their mills in that country 50 tons of rubber a month, in each case, from Colombo and Singapore. Similar applications from manufacturing firms in France will also be considered.

"It is proposed also to allow shipments of rubber from Colombo and Singapore to Vladivostok for use in Russia as soon as the Russian requirements have been ascertained."

Recent advices mention a long cable message from Ambassador Page, London, in which British views on embargoes are said to be fully outlined. Great Britain asks that the United States government use all her efforts to prevent the shipment of contraband goods. It is understood that the United States will co-operate, and in that event the embargo would be lifted.

SENTIMENT IN THE FAR EAST—AND FACTS.

There is even more unrest in the planting districts in Ceylon and Malaya than in the United States. A shortage of acetic acid frightened the planters into coagulating experiments with sulphuric acid "toddy vinegar" (made from cocoanut shells), air and smoke processes, etc. It may be that plantation "pellets" will one day be in the market just as are the Brazilian.

Restriction of output was also preached. In Malacca it was proposed to tap only every other day, and in the Straits five days a week.

Both Ceylon and the Malay States have made and are making strenuous representations to the Colonial Secretary concerning the loss of their "second best customer," the United States. These will undoubtedly be listened to with as much attention as any of the many protests.

The American Consul at Colombo, Ceylon, Mr. W. A. Leonard,

is very active in informing our own state department and trying to get a modification of the embargo.

A suggestion that the United States prohibit the export of crude rubber from its own ports is being widely copied in the papers in the Far East.

DUTCH EAST INDIES.

A telegram from Batavia, Java, announces that no prohibition is to be placed on rubber shipped from the Dutch possessions in the Far East. According to the American consul there, the monthly shipments from Java and Sumatra amount to 53 tons. The new Dutch boats begin sailing from New York to Java and Sumatra ports direct the 20th of December.

The "Times of Ceylon" says, in part:

WHAT AMERICA WOULD DO.

"Local producers and exporters are hopeful that the United States government will come to the assistance of rubber importers in that country. Guarantees from individual importers in America that rubber purchased by them was for internal use only and was not for re-exportation would be of little practical value. How could such guarantees be enforced and how would it be known that rubber, originally purchased for internal purposes, might not change hands in America and be re-shipped? However, if the American government could prohibit the re-exportation of rubber from the United States the situation would be completely and most satisfactorily solved. The fact that rubber is contraband must be borne in mind in this connection, and the opinion in Colombo rubber circles is that America could not be accused by Germany of a breach of neutrality if she took such action."

EMBARGO EFFECTS.

THE Rubber Manufacturers' position as to the effect of the Rubber Embargo is thus summarized in a statement prepared by the Rubber Club of America:

The British decision holding crude rubber a contraband of war cuts off 50 per cent. of the normal supply required by the United States.

The embargo has resulted in an increase of from 35 to 45 cents a pound, or 50 per cent., in the crude product. The statement asserts that the 125,000 Americans employed in the rubber industry will suffer if present conditions continue. The cost to the industry of the embargo is \$250,000 a day, it was stated. The statement says in part:

"The reason for Great Britain's drastic action is to be found in her determination to prevent Germany and her allies absolutely from obtaining any of the crude rubber grown on the great plantations in the British colonies of Ceylon and the Federated Malay States. The importance of rubber in the present war is evident from the extensive use of automobiles for all kinds of transport, as well as rubber footwear, ground sheets, clothing and balloon fabrics.

"During the early days of October, England began to treat crude rubber as contraband of war, and about the same time placed an embargo on all shipments of rubber from the colonies to any but English ports. This meant that all direct shipments from Singapore and Colombo to New York were stopped. But rubber came on from London as before. On November 13, England extended the embargo to apply to all shipments of crude rubber from all English ports to any countries except those of her allies. Since that time no plantation rubber has been shipped to the United States.

"A special committee of rubber manufacturers and importers has been working with the State Department at Washington on this problem, and the State Department is thoroughly alive to the importance of the situation. Owing, however, to the uncom-

promising attitude of the British Government nothing has been accomplished, and the industry and the consuming public faces a very serious situation.

"Unlike the majority of our American industries, the rubber industry is entirely dependent upon crude rubber imported from foreign countries. In fact, the rubber industry is probably the largest business in this country wholly dependent on raw material brought from abroad. This makes the cutting off of her principal source of supply doubly serious.

"At the present time the only sources of supply for American manufacturers are South America, Mexico and Africa. The Brazilian rubbers are normally considered more expensive, and the African and Mexican rubbers are of inferior quality. Six or seven years ago the greater part of the crude rubber used in this country came from Brazil. On account of the increased consumption, due largely to the manufacture of automobile tires, production since that time has been increased by the addition of the cultivated rubber of the Far East, until at the present time 60 per cent. of the crude rubber used in American factories comes from the British Empire. During this time consumption has fully kept pace with the increased supplies.

"The normal consumption of rubber in the United States at the present time is about 60,000 tons annually. Of this amount about 35,000 tons is plantation rubber, which normally sells from about 45 cents to 55 cents a pound. Already the embargo has forced the price up to about 90 cents. Normally about 200 tons of crude rubber per day is consumed in the United States. On account of this great increase in cost of rubber and its collateral results, the increased cost to the industry is approximately a quarter of a million dollars per day. As to what the ultimate per diem cost to the industry will be, if the present embargo is allowed to remain, no one can predict.

"It is not only in the increased prices of rubber goods that the people of the United States will suffer through this seemingly unwarranted embargo. Fully 125,000 people are directly or indirectly employed in the rubber manufacturing industry. Already owing to the slowing up of mills due to the lack of supplies it has been necessary to lay off a good many employees. In the city of Akron alone, known throughout the country as The Rubber City, 25,000 people are employed in the rubber factories. Pennsylvania, Delaware, New York, New Jersey, Connecticut, Rhode Island and Massachusetts are important rubber manufacturing States. Unless some arrangement with the British Government is arrived at soon the effect on this important industry will be far reaching and the consumers throughout the country will be obliged to pay increased prices for all rubber goods."

IMPORTANT ADDITIONS TO THE "CONTRABAND."

The recent additions to Great Britain's contraband list will continue to effect the American rubber industry. The following are now absolute contraband: Sulphur, glycerine, zinc and lead ores, acetones, fractions of distillation between benzol and cresol, inclusive; antimony, together with sulphides and oxides of antimony; tires for motor vehicles and cycles, and repair material; rubber waste and reclaimed rubber; goods made wholly of rubber.

An American advertisement, signed by a New York crude rubber firm, in a leading German paper reads thus:

DIRECT PURCHASE AND SHIPMENT OF CRUDE RUBBER TO GERMANY AND AUSTRIA-HUNGARY.

I offer my services for the purchase of crude rubber and gutta percha of all kinds in this market. Shipment by neutral vessels to Sweden, Norway, Denmark or Italy. Cash here against receipt for delivery of goods or bill of lading. Freight and insurance against war risks can be covered here, but must be paid for in advance.

MECHANICAL RUBBER GOODS MANUFACTURERS' ASSOCIATION BECOMES A DIVISION OF THE RUBBER CLUB OF AMERICA.

AT a meeting of the Mechanical Rubber Goods Manufacturers' Association, held at the Union League Club, New York, December 10, it was unanimously decided that they should become a division of the Rubber Club of America.

A dinner preceded the business meeting, at which about 35 representative manufacturers sat down to a table handsomely decorated with chrysanthemums and autumn leaves. At the business meeting Mr. George B. Hodgman, president of the Rubber Club of America, proposed them as a division of the Club.

He was followed by Mr. William T. Cole, of the Fabric Fire Hose Co. and president of the association; Mr. George E. Hall, of the Boston Woven Hose & Rubber Co.; Mr. Howard E. Raymond, of The B. F. Goodrich Co.; Mr. John J. Voorhees, president of the Voorhees Rubber Manufacturing Co. and secretary and treasurer of the association, and Mr. S. D. Baldwin, president of the Cincinnati Rubber Manufacturing Co.

Upon motion of Mr. Raymond it was voted that the Mechanical Rubber Goods Manufacturers' Association disband and that the membership be transferred to the Rubber Club of America, with the recommendation that all firms in the mechanical branch of the rubber trade join this division. This was unanimously passed. Mr. William T. Cole was then elected chairman of this division.

President Hodgman has done notable work in merging this association with the Rubber Club of America, as it will greatly strengthen both organizations.

Mr. Cole is also just the man for the position of division chairman—he is capable, energetic and popular.

FIRMS REPRESENTED AT THE BANQUET

The Acme Rubber Manufacturing Co., Trenton, N. J.
 Boston Woven Hose & Rubber Co., Cambridgeport, Mass.
 Boston Belting Co., Boston, Mass.
 Beck, Wm. & Chas., Lawrence, Mass.
 Continental Rubber Works, Erie, Pa.
 Canfield Co., The H. O., Bridgeport, Conn.
 Cincinnati Rubber Manufacturing Co., Cincinnati, Ohio.
 C. C. Fire Hose & Rubber Co., Canton Junction, Mass.
 Callahan Co., Cornelius, Boston, Mass.
 Dick, R. & J., Limited, Passaic, N. J.
 Empire Rubber & Tire Co., Trenton, N. J.
 Essex Rubber Co., Trenton, N. J.
 Electric Hose & Rubber Co., Wilmington, Del.
 Eureka Fire Hose Manufacturing Co., New York
 Fabric Fire Hose Co., New York
 Goodyear Fire & Rubber Co., Akron, Ohio
 Goodrich Co., The B. F., Akron, Ohio.
 Gutta Percha & Rubber Manufacturing Co., New York.
 Home Rubber Co., Trenton, N. J.
 Howe Rubber Co., New Brunswick, N. J.
 Keystone Rubber Manufacturing Co., Erie, Pa.
 New Jersey Car Spring & Rubber Co., Jersey City, N. J.
 New York Rubber Co., Matteawan, N. Y.
 New York Belting & Packing Co., New York.
 Niedner's Sons Co., Charles, Malden, Mass.
 Peerless Rubber Manufacturing Co., New York.
 Pennsylvania Rubber Co., Jeanette, Pa.
 Republic Rubber Co., Youngstown, Ohio.
 Rubber Stopple Co., Long Island City, N. Y.
 Revere Rubber Co., Chelsea, Mass.
 Rubber Goods Manufacturing Co., New York.
 Thermoid Rubber Co., Trenton, N. J.
 United & Globe Rubber Manufacturing Cos., Trenton, N. J.
 Voorhees Rubber Manufacturing Co., Jersey City, N. J.
 Whitehead Brothers Rubber Co., Trenton, N. J.

A fire has done \$30,000 damage to the wool boot factory at Hastings, Michigan, belonging to the United States Rubber Co. It was started by friction in machinery on an upper floor.

THE RUBBER CLUB RELIEF FUND FOR EUROPEAN WAR SUFFERERS

Contributions to the relief fund for the European war sufferers, started by the Rubber Club of America, to the amount of \$2,003.50, had been received up to December 26. Donations of \$25 or more, in addition to those published in our issue of December 1, are as follows:

AMERICAN RED CROSS.

United States Rubber Co., New York.....\$100
 American Hard Rubber Co., New York..... 50
 Boston Woven Hose & Rubber Co., Boston.... 25

\$175

BELGIAN RELIEF FUND

Rubber Sundries Manufacturers' Association (in lieu of their annual dinner)\$200
 Tyler Rubber Co., Andover, Mass..... 100

\$300

The amount contributed to the Belgian Relief Fund has been forwarded to the Belgian consul, Liverpool, Account No. 8, the particular branch of this work in the interest of which Mr. F. I. Buckleton, of the Northwestern Rubber Co., of Liverpool, recently visited this country.

Besides the sums above noted and those already published, \$828.50 has been contributed in lieu of tickets for the sixteenth annual banquet which has been abandoned this season.

THE RUBBER TRADE ASSOCIATION OF NEW YORK HOLDS ANNUAL MEETING.

The first annual meeting of the Rubber Trade Association of New York, an organization formed in October last by about 20 New York rubber importers, brokers and dealers in crude rubber, and mentioned on pages 665 and 79 of the September and November numbers of this publication, held its first annual meeting on November 2, when a few changes were made in the board of directors and committees. On the list of directors the name of A. V. W. Tallman has been substituted for that of H. A. Astlett. The membership committee has been increased by two additional members, Charles T. Wilson having resigned and the names of W. G. Ryckman, L. W. Bayles and T. H. Desmond been added.

The association reports rapid progress and encouraging support, its membership being about double that at time of organization, with further applications before the committee, and many manufacturers having expressed willingness to co-operate in any way likely to benefit the trade.

A NEW RUBBER COMPANY AT BUCYRUS.

The Bucyrus Rubber Co. has incorporated for the manufacture of rubber goods and has secured a factory at Bucyrus, Ohio. This company has an authorized capital stock of \$150,000, in 6,000 shares of \$25 each. Morgan Howells, the general manager—who is also vice-president and general manager of the recently organized Penn Rubber Traffic Co., and who claims responsibility for the organization of the Morgan & Marshall Rubber & Tire Co. and the Chester Rubber & Tire Co.—states that it is the hope of the company to be manufacturing on or about March 1, the output to include tires and tubes, belting, hose rubber, soles and heels. The old plant of the Bucyrus Steam Shovel & Dredge Co. has been secured and will be equipped for this line of manufacture. This property covers an area of 3½ acres, the buildings having a floor area of 47,715 square feet. The officers and directors of the company are: Elmer E. Gallup, president; Patrick J. Carroll, vice-president; Jay Taylor, treasurer; George B. Smith, secretary; Morgan Howells, general manager, and David C. Thornburg. The company also has a Pittsburgh office, at Third avenue and Wood street, in charge of G. B. Smith, general sales manager.

The Editor's Book Table.

THE LOWER AMAZON. A NARRATIVE OF EXPLORATIONS IN the Little Known Regions of the State of Para, on the Lower Amazon, with a Record of Archaeological Excavations on Marajo Island, at the Mouth of the Amazon River, and Observations on the General Resources of the Country. By Algot Lange. [8vo, pp. 468, with 6 maps and 109 illustrations. 1914. G. P. Putnam's Sons, New York and London.]

THERE is genuine entertainment in this volume of exploration and observation in a part of eastern Brazil which includes within comparatively small area some of the best and some of the least known parts of the country. This takes in the city of Para and the hinterland of that region.

Mr. Lange makes a sweeping division of Brazilians into two classes—those who wear shoes and those who do not—and he gives his hearty preference to the latter. Some of his anecdotes illustrate the extremes of these classes. Only a few hours' journey from Para

he was entertained by a rubber worker who ceremonially put on a shirt in honor of his guest but deliberately took it off and hung it on a bush when he went out to work. A little later, when Mr. Lange had returned to Para, he was refused admittance to a street car because he did not have on a necktie. Of the high society of Para, with its "South American Paris," with "its two blocks of electric glare" and its taxicabs, which whiz five or six blocks and then whiz back because there is no road on which to whiz any further," Mr. Lange has opinions not at all flattering; but for the "Caboclos," or half-breeds, who form the working class of the interior, he has unbounded regard. In this he is following the opinion of the best ethnologists, and his descriptions of the people and the reception they gave him show them in a very attractive light. We have had descriptions, often and again, of the rubber-worker and his melancholy rounds tapping the trees; but this book takes us into the rubber-worker's home and shows him as a human being, describing not only his work but his economics, his household furnishings or lack of them, and his diversions.

Prices of all civilized requirements are enormous, but still they have suffered a great decline since the days of three-dollar rubber. In this connection it is not inappropriate to express again the opinion, more than once given in this magazine, that, no matter how low the price is brought by plantation rubber, a certain amount of the Brazilian forest product will still be gathered. Much of the cost has been in the wholly absurd and artificial cost of the articles of commerce sent to the rubber



A YOUNG GIBOIA. THIS YOUNG BOA CON-
STRICTOR SOON GREW TAME AND PLAYFUL.

forests in exchange for the district's one product and, as the price of rubber declines, the worker's money will go further, his simple requirements will still be met, and he will still gather rubber.

The description of the flooded districts is particularly interesting, but the references to animal life are scanty and unsatisfying. He states that he is anxious to get a big snake-skin to show certain doubting friends in New York that there are some snakes along the Amazon. His helpers brought him a skin eleven feet long, but he says that he wants one five times that length. Mr. Lange is evidently not one of those who want but little here below nor want that little long. Mr. Lange visited with one tribe of Indians where the men are entirely nude and states that during his stay he adopted the national costume, save for one unimportant detail. Presumably, he wore his eye-glasses. And this, be it remembered, was but a short journey from the town where he could not board a street car for lack of a necktie.

The author has brought with him to New York a large collection of ancient pottery, which is, after all, more informing than snake-skins. A large number of the pieces are shown in illustration. The chapter on the products and prospects of Brazil does not, of course, make any claim to be an exhaustive treatment of so vast a subject. An appendix gives a vocabulary of the Indians with whom the author visited. An index-glossary is a helpful feature for the average reader.

INSULATION AND DESIGN OF ELECTRICAL WINDINGS. BY A. P. M. Fleming, M. I. E. E., and R. Johnson, A. M. I. E. E. Longmans, Green & Co., London and New York. [8vo, 224 pages, cloth covers.]

This is a very thorough treatment of the subject from an electrical point of view. In this day of high voltages and larger and more costly units a book of this sort is timely. The authors in the preface mention that insulation is the vulnerable part of electrical machinery. This is unfortunately true, and manufacturers and users often have suffered from unreliable insulation. The authors, who have had many years' practical experience in connection with insulating problems, have covered the field very thoroughly. To do this they have given the underlying principles covering insulation, and pointed out methods by which insulation can be carried out with precision. The volume is adequately illustrated by diagrams, and has a very complete and excellent index.

DE RUBBER-CULTUR EN DE RUBBER-HANDEL VAN NEDER-landsch Indie. By W. J. van de Leemkolle. Ruysch & Co., Batavia, 1914. [Paper cover, 48 pages.]

The book is a reprint of a lecture read during the first rubber congress in Batavia, in October last, and covers the whole field of rubber planting and rubber trade in the Dutch possessions of India. *Hevea* was introduced in Dutch India in the year 1876. Further experiments were made, beside *Hevea*, with *Castilloa elastica*, *Ficus elastica* and different kinds of *Manihot*. In 1913 there existed 550 enterprises interested in the production of rubber in Dutch Indies, of which 332 were situated in Java. The area under rubber culture extended in 1906 in Java to 25,000 acres, but had reached in 1913 245,000 acres. In Sumatra there was in the same time an increase from 6,000 acres to 240,000. The lecture gives, further, a description of the situation in the different parts of the Dutch Indies, and contains a large quantity of statistical information, which is especially useful, as those statistics go deeply into details. The little book, which seems to be printed for private circulation only, deserves to be read, as it contains in a small space an enormous amount of

material, and is a valuable contribution to the literature on the economic development of the eastern rubber industry. The volume closes with a short bibliography of the existing literature.

NEW TRADE PUBLICATIONS.

THE India Rubber, Gutta Percha & Telegraph Works Co., Limited, Silvertown, London, are the publishers of a very beautiful souvenir. The occasion for its issuance was the presentation by the Rubber Growers' Association of rubber flooring to the Hospital for Sick Children. The presentation was made by Lady Jellicoe, the wife of Admiral Sir John R. Jellicoe, of the British navy. The booklet is illustrated with interior views, showing the rubber tiling laid in the consulting and dental rooms. Incidentally it is interesting to remember that the Silvertown company has furnished rubber tiling for over 200 battleships and liners, and more than 100 banks and public buildings.

The December calendar of the monthly series which the Derby Rubber Co., of Derby, Connecticut—manufacturers of reclaimed rubber—has sent out to the trade during the year just closed is artistically pleasing, as has been all its predecessors, the complete series forming an interesting collection of views appropriate to the different seasons.

Another set of monthly calendars has been received from W. G. Brown & Co., of Cincinnati, dealers in crude and reclaimed rubber, the final number for the year showing a big game hunting scene.

The Independent Rubber Co., Limited, of Merritton, Ontario, has recently sent out an illustrated catalog of its footwear. The book is nearly 4x8 inches in size, contains 72 pages, and is printed in two colors—black and buff. The use of the two colors enables the company to give at least an approximate idea of some of its colored rubbers. It makes, for instance, certain lumbermen's shoes with red soles. It also makes an all-red boot called the "Dreadnaught." Another interesting rubber shown in this catalog not known in the States is called the "Gem." It is a high-heeled croquet with a service heel, and has as its particularly distinctive feature a Jersey cloth top just covering the instep and fastened with three buttons. It has a general resemblance to the leather button Oxford. The half-tone cuts in the catalog give an accurate idea of the company's output.

The Manning, Maxwell & Moore Co., Inc., of 119 West Fortieth street, New York, publishes a complete and comprehensive catalog of 1,174 pages. It is illustrated with excellent half-tones of the various machine tools handled by this enterprising firm of machinery dealers. The great progress made in the manufacture of modern machine tools of all descriptions is shown in this book. Automatic machinery is taking the place of the slow and laborious hand operated machines. The electric motor is applied to any machine tool, if so specified. Many special tools for specific purposes in the tool room or laboratory are concisely described and rendered still more intelligible by adequate illustrations.

As the manufacture and repair of tires constitute such an important branch of the rubber industry, the two catalogs recently issued by the Williams Foundry & Machine Co., of Akron, are of special interest. One of them (in loose leaf form) deals with "Specialties for the Tire and Rubber Factory," including building stands, various forms of nest molds, hydraulic accumulators and collapsible cores. Prominence is likewise given to the advantages of the boltless quick opening simplex vulcanizer head, of which a number of patented models have been introduced, but have failed to achieve the success attained by the new system, which can be attached to any bolted vulcanizer, making it a thoroughly efficient machine. The new head is essentially a labor-saving device, and a time saver as well, one prominent

tire factory where it is in use taking only twelve minutes to open a press containing a stack of molds six feet high and to insert a new batch.

Another prominent feature of the Akron-Williams press and vulcanizer is the automatic packing and locking device, which requires no bolts or nuts for tightening, and which is attached to the combined tire press, vulcanizer, cooling tank and mold lift, which also has the quick acting boltless head.

The second catalog, in booklet form, contains a full description of the Akron-Williams automobile tire equipment.

Both the catalogs are abundantly illustrated, and are replete with information regarding the Akron-Williams products.

The November number of the "S. A. E. Bulletin" contains much that is of interest to the tire manufacturer. It covers, for example, the standard sizes of pneumatic tires that are under consideration for recommendation for car manufacturers. There is also a paper by L. Greenwald, of the Firestone Tire & Rubber Co., well illustrated, covering "Factors Affecting Tire Wear." There is also an exceedingly practical and informing paper on "Tire Fabrics" by Henry Van Riper Scheel, of the Brighton Mills. Both of the papers are followed by interesting discussions.

The "Trinidad and Tobago Bulletin," August-October, 1914, contains interesting notes on the extraction of oil from Para rubber seeds and *Castilloa elastica* seeds. The conclusion is that the Para seed is of value as an oil producer and for feed cake, but the seed of the *Castilloa elastica* is of doubtful value.

At the Thirteenth annual meeting of the Alumni Association of the Philadelphia Textile School an interesting paper was presented by Alvin Kingsbacher on the manufacture of motor tire fabrics. The article is chiefly historical—that is, there is nothing there that has not previously been exploited. It is, however, an excellent résumé of an important subject.

The "Electrical Review and Western Electrician," December 15, published an important paper on the electric code wiring rules. It is interesting in that the United States procedure is compared with the German and British requirements.

THE SEASON'S GREETINGS.

We acknowledge with appreciation cards and booklets from the following friends in the trade expressing kindly sentiments and holiday greetings, which we most heartily reciprocate: Ajax-Grieb Rubber Co., tire makers, Trenton, New Jersey; the J. H. Day Co., manufacturers of rubber mill machinery, Cincinnati, Ohio; W. H. Miner, of The Miner Rubber Co., Limited, which manufactures rubber footwear, Granby, Quebec; Monatiquot Rubber Works Co., manufacturers of "Naturized" rubber, South Braintree, Massachusetts, and L. J. Mutty Co., manufacturers of rubber cloths and tubing, Boston.

Many other friends in the trade have favored us with calendars, souvenir booklets, etc., all of which will be mentioned in greater detail in the February number.

"RUBBER-RECEUIL."

This is a beautiful souvenir of the International Rubber Congress and Exhibition held in Batavia in October. The papers, which were delivered in Dutch, German, French and English, are printed in those languages and abundantly illustrated. An interesting portion of the booklet is a symposium of planting ideas submitted by the managers of some 80 rubber planting estates, arranged and edited by Mr. L. Lewton-Brain, Director of Agriculture of the Federated Malay States.

For the first time in the history of the crude rubber export, plantation rubber is coming to the United States by way of the Pacific. Shipments from Java are now sent to Hongkong, transferred to the Pacific Mail, and landed at San Francisco.

Some Interesting Letters From Our Readers.

PROPOSAL FOR A DISTRIBUTING AGENCY FOR PARA RUBBER.

THE writer of the following letter is now in New York. He has for many years connected with large rubber export interests in Para. He writes this letter to stimulate the interest of American rubber manufacturers in the prospect of securing their rubber direct.

"Rubber is at present imported to the United States in the following three ways: 1—Bought by contract directly from the few dealers (J. Marques, Pires Teixeira & Co., Pralow & Co., Ferreira d'Oliveira & Sobrinho). 2—Sent by merchants on consignment (dealers and a few *aviadores*). 3—Sent by agents of American houses to their head offices.

"In the first case the American merchant sends a letter of credit which enables the Amazonian dealer to draw the amount of the invoice. In the second case the merchant draws a certain percentage, generally 80 per cent. In the third case the agents have at their disposition certain funds to buy rubber there.

"The *aviadores*, the producer's representatives—daily receive rubber which they sell at the market price of the day as it is set by the dealers. This price, of course, is the consequence of the speculation of the dealer in selling the rubber before he has as yet received it (forward selling). The New York and London markets do not influence Amazonian rubber trade as they ought to. Thus the price offered there is often lower than it is here, and vice-versa. The *aviador* knows nothing of the speculation, and is often obliged to sell the rubber at lower prices than he could get by selling it directly to this market. The reason for this is that he ignores the calculations, which are very complicated and involve the daily changes of duty, freight, exchange, shrinkage and expenses here and there. This naturally requires a special study.

"My proposition is based upon this: We should deal directly with the *aviadores*, instructing them as to the proper calculations and furnishing them with adequate Portuguese codes through which they will be able to accept our offers. Instead of his selling to the dealers in Para he will be able to sell his rubber to the manufacturers through our medium. In fact a few good standing firms from Para which are receiving many thousands of kilos. of rubber monthly have authorized me to make this proposition.

"Of the 40,000 tons of rubber or 88,200,000 pounds which is the yearly Amazonian output, more or less, the United States buys, according to the statistics, about 50 per cent., or say, 44,100,000 pounds of rubber. Let us assume that the *aviadores* will sell 50 per cent. of this quantity through our medium. We will then have 44,100,000 pounds of rubber sold, of different grades.

"The actual price is: Hard fine, 72c.; Soft fine, 65c.; Caucho, 54c.; Upriver coarse, 53c.; Island coarse, 32c.; Cameta coarse, 34c. The average, being 50c. per pound, will make our sales amount to \$2,205,000 per year. Taking into consideration that we make 1.5 per cent., half of the Para dealer's profit, and 0.5 per cent. on the New York brokerage, which is 1 per cent., we will be able to make at least 2 per cent. on the \$2,205,000, which amounts to \$44,000.

"The *aviador* is furnished only with a letter of credit stipulating the conditions as to the correct weight, quality and amount, against which, after the shipment has been made, he draws at 90 days. No capital, consequently, is required for this transaction. The consumer's note when buying is the guarantee for the producer's letter of credit. In other words, the bank will issue a letter of credit against the security of the buyer's note.

Sound and reliable firms, of course, are contemplated. Otherwise they would not be able to negotiate their drafts."

OPENING FOR AMERICAN RUBBER GOODS IN LONDON.

THE following is from a London letter, written by a man who has in the past been a solid tire agent but whose source of supply is cut off on account of the war:

"I do not propose to enlarge upon the complete cessation of business between my country and Germany owing to the war, except to say that a magnificent opportunity now presents itself for securing some of the very large business German houses were doing in England in solid and pneumatic tires. I believe they secured 60 per cent. of the trade and their preparations for 1915 were very extensive.

"The salient points for securing British trade are:

"(1) Observance of English mileage guarantees to 10,000 or 12,000 miles.

"(2) Working to English measurements for standard sets. These are now of course rendered principally in millimetres.

"(3) Holding an adequate stock in London.

"Competition is of course very keen, which inevitably tends to reduce prices, but a high quality is demanded and the necessary price for such should not be a difficult matter if backed up with an efficient publicity campaign.

"Prices ruling today are round about £40 to £44 [\$19.45 to \$21.39] for a set of 6—two 920x120 and four 1,000x100—and £52 to £55 [25.30 to \$26.77] for two 880x120 and four 1,010x120, and so on; manufacturers paying the cost of fitting, which amounts to about 30s. [\$7.30] per set.

"I am merely giving these figures in order that if the proposal interests any of your manufacturers they may have some data upon which to figure out the success of a proposed attempt.

"Then there are the other branches of the rubber trade, such as mechanicals, hose, surgical goods—all of which are in great demand."

FROM HAMBURG.

AN important German rubber firm writes us under date of December 8:

"In the first half of the year business was not bad, without deserving to be called good. An extensive over-speculation in sites and buildings had caused this branch of economic life to suffer acutely, and had damped the spirit of enterprise. This fact to a certain extent affected other branches of industry.

"The war has naturally caused a great revolution in business life; but as the fighting is going on in the enemies' countries, a feeling of confidence prevails in all circles. The degree in which German industry is occupied varies considerably. All factories having directly or indirectly to do with deliveries for the army or navy are fully engaged and working in many cases with an increased force day and night. Those factories, however, which make objects of luxury and those principally devoted to export trade have had to limit their operations, but only in isolated cases has there been a complete stoppage of the plant.

"Moreover, the German rubber industry is now heavily engaged in war supplies, thousands of power vehicles being occupied for the army and having extensive requirements in pneumatic tires. Countless large and small articles in soft and hard rubber are wanted for ships, engineering troops' appliances and hospital purposes. But even in our industry the want of export orders is noticeable, the situation being accentuated by the export pro-

hibition recently issued by the government, which must be regarded as a retaliation for the English declaration of rubber as contraband. The step has been taken in the interest of the permanent readiness of the army, and is intelligible, as with the present supplies of crude rubber, although of themselves not unimportant, which were increased by large quantities from Antwerp, economy must be observed. Of late, all rubber with dealers and manufacturers has been attached, with the liberty to use it only for the necessary requirements, which are indicated in detail. The number of workers must, therefore, now be restricted, and we would be inclined to believe that the average production of the factories will not exceed one-third of that in times of peace.

"We have also been obliged to limit our operations. The workmen taken for the army, about one-fifth of our staff, have not been replaced, and the working time has been reduced to about four days a week. With any restriction, the workmen always earn enough to be able to live without anxiety. Under these circumstances, the rubber in the country will suffice for a very long time.

"Sufficient provision has been made for the families of the workmen drafted to the field, by the factory management and the state funds. Moreover, state and municipalities provide remunerative occupation for all the unemployed, on public buildings, railways, highway and canal works; and the expenditure of large sums is projected to support the industries most affected by stock orders for the public departments. It is distinctly stipulated that the necessity will not be utilized for the reduction of wages."

PRIZES AT THE BATAVIA RUBBER EXHIBITION.

POSTPONED by reason of the war, the Rubber Exhibition was opened at Batavia on October 19 by His Excellency the Governor-General of Netherlands India, supported by General (retired) De Voogt and other officials, including Heer Ottolander, president of the Agricultural Syndicate of Netherlands India and Heer Van Rijmberk, of Singapore.

The prizes awarded included:

THE INDIA RUBBER WORLD cup: To the Belgian Ministry of the Colonies; for the most complete exhibit referring to wild rubber. (Cup illustrated and described in issue of June, 1914, page 510.)

THE JURY cup: To the Holland-American Plantation Co.; for a display of models of hospitals and coolies' dwellings meeting sanitary and aesthetic requirements.

THE BATAVIA, 1914, cup: To the mountain section of the Association for the Promotion of Agriculture and Industry at Djember, and the Bezoekisch Testing Station; for the most complete exhibit referring to the cultivation of *Hevea Brasiliensis*.

THE SOERABAYA HANDELSBLAD cup: To the firm of Francis Peek & Co.; for the most complete collection from Netherlands India referring to *Hevea Brasiliensis*.

THE WEST JAVA RUBBER PLANTERS' cup: To the firm of Harrisons & Crossfield; for the most complete exhibit referring to machinery.

THE OTTOLANDER cup: To the collective exhibit of the Department of Agriculture, Industry and Commerce.

Full reports of the congress and exhibition are expected at an early date, also the results of further competitions.

A prominent feature of the congress was the demonstration by Heer Fol, assistant director of the Delft (Holland) Laboratory, of the different methods of rubber testing. A committee was appointed to establish a new testing station in Java, in which the Bridge installation (demonstrated by Heer Fol) would be employed. The proposal has received the support of several of the largest rubber culture associations.

During the time of the congress various interesting papers were read, including those of Mr. Birnie on "Catch Crops and Intermediate Cultures"; Heer C. M. Hamaker, on "Planting Dis-

tances and Thinning Out"; Dr. Cramer, on the "Selection of *Hevea*"; Dr. Rutgers, on "Insects and Diseases of *Hevea*"; Dr. A. W. E. de Jong, on "Tapping and Tapping Systems," and Dr. A. J. Uitée, on "The Preparation of Rubber." A discussion on the "Cost Price of Rubber" was opened by Mr. Birnie.

RUBBER TRADE INQUIRIES.

[100] A manufacturer of nipples, comforters, etc., wishes to get in touch with firms supplying bone rings or aluminum rings and plates, etc.

[101] An exporting house is in the market for "Sakel" rubber cement and desires to learn name of the manufacturer.

[102] A rubber toy manufacturer wants names of concerns making whistles that can be incorporated in this class of article, and that can be blown by pressure of the rubber toy.

[103] Requests have been received for names of manufacturers of gutta percha tissue.

[104] Another inquiry—from the rubber chemical industry—is for "Carbonilid."

TRADE OPPORTUNITIES FROM CONSULAR REPORTS.

A commission house desires to communicate with American manufacturers of hospital supplies, such as rubber tubes and sponges, etc. Correspondence should be in French or Portuguese. Report No. 14,908.

A commission firm in the Near East desires American agencies for rubber shoes, etc. Report No. 14,912.

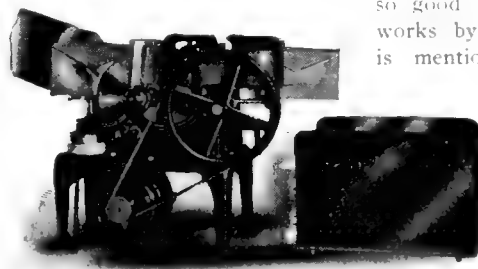
An old established tobacco pipe manufacturer in Great Britain desires to purchase vulcanite mouthpieces from the United States. A sample mouthpiece may be inspected at the Bureau of Foreign and Domestic Commerce or its branch offices. Report No. 14,917.

A RUBBER COMPANY IN THE MARKET FOR MACHINERY AND SUPPLIES.

The Southern Rubber Products Co., 624-6 South Third avenue, Louisville, Kentucky, is equipping a plant for the manufacture of inner tubes and rubber specialties. This plant will have a capacity at the start of 400 tubes a day. The company is in the market for machinery and also for samples and quotations on rubber and chemicals used in this line of manufacture. It was recently incorporated, with a capital stock of \$25,000.

SEALING MACHINE WITH RUBBER ROLLERS.

Where there is a single envelope to be sealed it is not a matter of vital importance as to how it is done—the time-honored method of using the tongue is quite satisfactory, if that method is to one's taste. But where there are a thousand envelopes to be sealed some other method must be pursued. Various sealing devices have been put on the market, some good and some not so good. Here is one that works by electricity, and it is mentioned here because



an important part of its construction consists of five rubber rollers. Two of them are shown in the accompanying illustration, at the top of the machine, just back of the large wheel. The envelope is first placed between a rubber roller and a wheel with a moistened edge which wets the mucilage on the flap. The envelope is then carried on between two pairs of rubber rollers, which effectually seal it. Both machine and tray are equipped with rubber feet so as not to scratch the desk or table. [Sealograph Company, Kansas City, Missouri.]

Official India Rubber Statistics for the United States.

IMPORTS OF RUBBER AND MANUFACTURES OF.

	1913.		October 1914.		1912.		-Ten Months Ending October-		1913.		1914.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
India rubber, etc., and substitutes for the same.												
Unmanufactured—												
Balata.....	60,433	\$44,537	381,708	\$133,633	821,217	\$515,129	1,083,634	\$579,102	1,478,850	\$694,681		
Guayule.....	166,414	62,811	226,995	65,139	10,683,471	4,738,104	4,832,222	2,106,624	1,302,671	505,401		
Latex.....	2,074,445	91,513	545,612	28,351	4,372,140	1,957,824	34,531,603	1,669,593	17,471,331	806,189		
Gutta-percha.....	32,719	26,666	40,998	7,671	638,295	146,288	703,850	154,728	1,798,516	314,674		
India rubber.....	8,478,376	4,585,074	12,883,687	5,836,645	97,308,544	82,391,075	95,626,118	66,237,855	119,227,855	59,816,727		
India rubber and gutta-percha fit only for remanufacture.....	1,788,409	132,770	967,994	63,143	29,574,820	2,446,019	33,534,559	2,927,205	17,504,670	1,254,104		
Total unmanufactured.....		\$4,943,371		\$6,134,382		\$92,194,439		\$73,675,107		\$63,391,776		
Manufactures of—												
Gutta-percha.....		\$12,172		\$344		\$76,199		\$29,400		\$19,945		
India rubber.....		122,417		70,226		914,954		1,022,330		1,242,234		
Total manufactures of.....		\$134,589		\$70,570		\$991,153		\$1,051,730		\$1,262,179		
Substitutes, elastics and similar.....		\$5,330		\$3,160		\$75,753		\$82,894		\$59,778		

IMPORTS OF CRUDE RUBBER BY COUNTRIES.

From:												
Belgium.....pounds	411,212	\$220,917			4,881,463	\$4,934,921	5,251,097	\$4,042,613	9,018,596	\$5,028,504		
France.....	474,439	193,811	167,805	\$55,400	3,163,639	2,957,383	2,224,137	1,570,380	2,107,247	899,281		
Germany.....	463,294	225,599			7,462,069	5,910,108	6,034,468	3,789,827	4,631,589	2,336,218		
Portugal.....			203,100	\$4,103	1,447,243	999,874	322,063	238,636	1,092,579	328,161		
United Kingdom.....	2,923,166	1,904,600	6,017,180	2,918,701	27,078,796	28,586,388	32,240,015	26,880,348	44,405,211	25,791,043		
Central American States and British Honduras.....	50,566	29,106	42,611	13,153	1,074,389	787,989	757,444	478,265	425,018	199,509		
Mexico.....	33,145	20,144	274,332	92,623	2,196,215	1,551,719	1,408,143	882,798	785,644	340,063		
Brazil.....	2,808,824	1,217,226	3,838,532	1,557,385	40,326,869	27,196,272	33,790,530	17,191,640	35,378,894	13,797,258		
Other South America.....	73,217	32,664	49,208	32,546	2,315,709	1,745,525	1,209,064	747,255	1,917,963	759,821		
East Indies.....	1,148,989	699,181	2,290,012	1,112,160	6,828,405	7,163,413	11,719,409	9,958,071	17,783,823	9,402,059		
Other countries.....	91,524	41,826	907	574	533,747	557,383	669,748	458,022	1,681,291	934,810		
Total.....	8,478,376	4,585,074	12,883,687	5,836,645	97,308,544	82,391,075	95,626,118	66,237,855	119,227,855	59,816,727		

EXPORTS OF AMERICAN RUBBER GOODS.

India rubber, manufactures of												
Scrap and old.....pounds	322,543	\$45,013	70,774	\$5,731	5,936,037	\$699,007	4,906,970	\$672,261	4,056,071	\$393,737		
Reclaimed.....	422,120	73,593	459,201	65,926	4,434,596	758,139	4,278,005	721,549	5,105,728	720,518		
Belting, hose and packing.....		265,798		176,279		2,125,333		2,157,583		1,823,740		
Boots and shoes—					350,025	351,281						
Boots.....pairs	9,385	28,168	75,219	182,977	238,153	243,436	96,730	235,296	155,187	386,411		
Shoes.....	229,760	108,672	182,500	98,481	21,056,418	2552,399	1,741,182	884,497	1,048,109	562,951		
Tires—												
For automobiles.....		237,116		247,559		2,759,339		3,481,131		2,803,912		
All other.....		75,207		35,159		485,908		504,875		388,403		
All other manufactures of.....		330,962		219,723		3,378,087		3,203,394		2,505,508		
Total.....		\$1,164,529		\$1,031,335		\$11,354,529		\$11,860,586		\$9,587,180		

EXPORTS OF AUTOMOBILE TIRES BY COUNTRIES.

India rubber, manufactures of												
Tires for automobiles—												
Belgium.....		\$18				\$318,474		\$98,949		\$301		
Germany.....		3,235				1,258		425,773		81,917		
England.....		68,135		\$103,894		686,305		1,198,419		1,174,955		
Canada.....		7,696		37,033		951,944		1,057,285		833,065		
Mexico.....		19,965		9,792		17,423		133,663		59,957		
France and Islands.....		9,418		31,735		5,039		111,257		124,310		
Other countries.....		56,574		65,045		263,492		455,785		529,407		
Total.....		\$237,116		\$247,559		\$2,759,339		\$3,481,131		\$2,803,912		

EXPORTS OF FOREIGN MERCHANDISE.

	1913.		October 1914.		1912.		-Ten Months Ending October-		1913.		1914.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
India rubber, manufactures of												
Latex.....				\$2,600		\$72,146		\$1,287		\$49,611		\$180,863
Gutta-percha.....								39,299		24,626		1,058
India rubber.....				2,000				35,000		2,163		
Other.....								22,337		2,652		5,653
Total.....				296,863		551,093		295,046		3,770,885		3,045,156
Manufactures of—												
Boots and shoes.....								101,309		12,153		324
Tires.....				\$192,890		\$97,146				\$3,136,361		\$2,519,039
Other.....				\$241		\$753				\$13,980		
Substitutes, elastics and similar.....										9,601		4,122
Total.....										\$559		

1. For the year ending June 30, 1914.

2. For the year ending June 30, 1913.

Twenty-Fifth Anniversary Congratulations.

[THE INDIA RUBBER WORLD passed its twenty-fifth birthday last October. It was the plan of the Editor to have a special jubilee number to mark the event. With the great year on, entailing disaster and suffering and involving hundreds of friends in England, France, Germany, Austria, Russia and Belgium, we had no heart to rejoice. The event has therefore been marked only by the publication of the following letters of congratulation, letters of which we are exceedingly proud. The Editor.]

"EMINENTLY FAIR AND A VERY REAL HELP."

[From the UNITED STATES RUBBER CO., President's Office.]

I understand that THE INDIA RUBBER WORLD is approaching its 25th birthday under your leadership, during all of which time it has been my pleasure to watch its growth and strength, as well as to count you among my personal friends. I have always felt that the aim of the paper was high, eminently fair, and a very real help to the rubber industry.

Please accept congratulations of myself and my associates, and best wishes for continued success.

[Signed] SAMUEL P. COLL [President].

"A CYCLOPEDIA OF SCIENTIFIC AND PRACTICAL INFORMATION."

[From the APSLEY RUBBER CO., manufacturers, Hudson, Massachusetts.]

I wish to add my congratulations to those of the large number of friends you have made during your long and exceedingly useful career as founder and editor of the best india rubber journal in the world.

In the 25 years of the existence of THE INDIA RUBBER WORLD you, as its editor, during that entire period, have presented to its readers a vast amount of information regarding the production, treatment and products of india rubber, which you, personally, have gathered in all parts of the world; so that your journal has become a cyclopedia of scientific and practical information upon this interesting subject.

For the good of the rubber business, I trust that you will continue to be the controlling spirit of THE INDIA RUBBER WORLD for many more years.

[Signed] L. D. APSLEY, [President].

CONGRATULATIONS ON "LES NOCES D'ARGENT."

[From MICHELIN & Co., manufacturers, Clermont-Ferrand, France.]

I heartily congratulate you on the 25th birthday of THE INDIA RUBBER WORLD.

In France, when a man and wife celebrate the 25th anniversary of their marriage, we call it "les nocces d'argent."

Allow me to congratulate the happy husband of the beautiful and faithful wife, THE INDIA RUBBER WORLD.

[Signed] EDOUARD MICHELIN [Director].

"THE READING OF ITS PAGES A DELIGHTFUL PASTIME."

[From the COMMISSIONER OF THE IMPERIAL DEPARTMENT OF AGRICULTURE FOR THE WEST INDIES.]

I assuredly must congratulate both you and THE INDIA RUBBER WORLD on your long and successful connection.

From my own point of view I am particularly impressed with the very interesting work you have been able to place on record as the result of world-wide personal travel to practically every country where rubber is grown and to many where rubber-growing is only a proposition for the future. In these travels you have investigated the various rubber plants themselves and have helped to unravel some of the botanical problems they present, at the same time you have been able to form a shrewd opinion as to the commercial possibilities of rubber production in the countries you have visited.

I would congratulate you, too, on the manner in which your observations have been presented to your readers; while the information has been useful and accurate, the quaintly humorous vein running through your articles has made the reading of those pages of a technical journal a delightful pastime.

I have also to express my high appreciation of the journal in its general bearing on rubber and rubber topics and wish both you and it long life and prosperity.

[Signed] FRANCIS WATTS [Commissioner of Agriculture for the West Indies].

HAS KEPT CONSTANT PACE WITH THE RUBBER INDUSTRY.

[From PIRELLI & Co., manufacturers, Milan, Italy.]

I understand that THE INDIA RUBBER WORLD is on the point of celebrating its 25th birthday and beg to send my heartiest congratulations to yourself personally and to your newspaper.

You have achieved a remarkable task by keeping constant pace during this long period with the wonderful strides that the rubber industry has made in connection both with its sources of supply as with the growth of old and the development of new appliances.

I join with pleasure in what I think must be the general acknowledgment of this fact.

[Signed] A. PIRELLI [Director].

THROUGH THE EDITOR'S LETTERS REALIZED PLANTATION POSSIBILITIES.

[From THE WATERHOUSE CO., LIMITED, rubber factors, Honolulu, T. H.]

I wish to congratulate you and THE INDIA RUBBER WORLD on your quarter-century birthday, as it is a rare event in newspaperdom for a periodical to round out the first quarter of a century with the same editor at the helm.

I and my associates were first interested in THE INDIA RUBBER WORLD through the series of interesting letters published by you of your trip through Ceylon and the Federated Malay States in 1905; and it was through these that we realized the possibilities of investments in rubber plantations in that part of the world.

THE INDIA RUBBER WORLD has been on our table ever since and is looked forward to with interest each month.

[Signed] ALBERT WATERHOUSE [President].

"ABLE, INSTRUCTIVE AND INTERESTING."

[From the HODGMAN RUBBER CO., manufacturers, New York.]

It has recently come to my notice that THE INDIA RUBBER WORLD is about to celebrate its 25th birthday, and I want to extend to you my congratulations.

I very well remember the time when your journal was started, and if I recollect right our company was among the first to take advertising space. THE INDIA RUBBER WORLD has certainly kept pace with the great advance in the last quarter of a century of the rubber industry in the United States, and we are fortunate in having as a trade organ one that is as able, instructive, and interesting as yours. May your success continue.

[Signed] G. B. HODGMAN, [President].

"REGARDED AS VITAL AND VERY USEFUL IN EUROPE."

[From THE NORTH BRITISH RUBBER CO. LIMITED, Edinburgh, Scotland.]

I learn with much interest that THE INDIA RUBBER WORLD is to celebrate its 25th anniversary this year.

Pray accept my congratulations, both for yourself and your valued periodical, which in Europe as in America has come to be regarded as a vital and very useful part of the rubber industry.

Although we are in the midst of war and European complications, we have still time to remember with pleasure our long

association with yourself and THE INDIA RUBBER WORLD, and our best wishes are with you for long life and continued prosperity.

[Signed] ALEXANDER JOHNSTON, *General Manager*

A CONSTANT READER FOR 22 YEARS.

[From: VULCANISIERE BERLIN FRANKFURTER GUMMIWAREN FABRIKEN, Berlin-Lichterfelde, Germany.]

For 22 years I have been a constant reader of THE INDIA RUBBER WORLD and dare say that I may be a competent judge of the marvelous, steady progress your journal has taken during this period. Success in life to my experience is not a matter of hazard, but mainly due to honest, steadfast work, with a strong will to succeed. Both these qualities have been harmoniously concentrated in your person, and that accounts for the brilliant development THE INDIA RUBBER WORLD has taken under your guidance and has made it the leading journal of the branch. I heartily beg to present you my best compliments on your jubilee day.

[Signed] EMIL SPANNAGEL, *[Manager.]*

"AN INFLUENTIAL, RELIABLE AND BROAD MINDED TRADE JOURNAL."

[From WM. M. IVINS, former President of the General Rubber Co.]

A slight jog to my memory recalls the fact that your INDIA RUBBER WORLD, as I now well recollect, began its career some quarter of a century ago. I sincerely congratulate you on the fact that it is about to celebrate its 25th birthday, but far more than this upon the fact that you have made it one of the most influential, reliable and broad-minded trade journals in the world.

[Signed] WM. M. IVINS.

"A VERITABLE ENCYCLOPEDIA."

[From J. SIMAO DA COSTA, prominent Brazilian rubber authority.]

I can recall the moment I had the pleasure of reading the first number of THE INDIA RUBBER WORLD, which you had the courage to found and publish, as its responsible editor, 25 years ago. The rubber industry was then still in its infancy. I believe I have read almost every number you have published since then.

It is not for me to judge as to the exact measure of your ambitions when you founded THE INDIA RUBBER WORLD, but I am able to judge of its success, such as you have made it both literary and commercially, holding, as it does, the premier position among the publications of its class all the world over. I believe I voice the opinion of all readers of your journal when I say that, in its particular sphere and literary domain, it has influenced and contributed, in no small degree, towards the building of the rubber industries of America, and raised them to their present state of prosperous affluence.

To accomplish all of this in the way you have done, by presenting monthly to your readers a light, interesting, enlightened, progressive, readable magazine, so thoroughly comprehensive as to constitute a veritable encyclopedia of all that pertains to this particular trade, is no mean task; but you have succeeded in accomplishing it, with distinction. But you have done more yet. You have also published standard technical books of no mean value, and have ransacked the tropical regions of both hemispheres, so as to give your readers a graphic idea of the people and surroundings wherein rubber is gathered and prepared for market.

For all of this, I am of opinion that the rubber industries in general, and in particular those of America, are deeply indebted to you, and you are deserving of the highest tribute for all you have done. For my part, and in the name of Pará, I tender my sincere congratulations for having devoted twenty-five years' enterprise to an industrial publication, and for having raised it to the highest place it could have reached all the world over.

Here, in Pará we have already had the opportunity of showing our appreciation for you, personally, and as leading

light of your magazine. And I venture to say that in spite of the hard times we are traversing, you would be just as cordially fêted again today if you were to visit us once more.

And now one simple personal remark. I do not envy your successful career as the editor of THE INDIA RUBBER WORLD, but I certainly envy that light gait, active spring of your step, and congenial disposition, which make you look like a youth of forty. And right here I must stop, as I do not wish to give your age away and run the risk of your immediate retaliation. Let us be boys, in spite of our grey hairs.

May God bless and keep you, are my sincere wishes for you and yours.

[Signed] J. SIMAO DA COSTA.

"THE MOST IMPORTANT FORCE IN RUBBER TODAY."

Not often does it fall to the lot of one man to conduct so important a journal as THE INDIA RUBBER WORLD for twenty-five years, and it gives me much pleasure, as an humble student of one of the most ill-understood products of daily use, to congratulate you on the successful manner in which you have carried on the journal, making it perhaps the most important force in rubber today.

[Signed] JOHN C. WILLIS,

Director do Jardim Botânico, Rio de Janeiro, formerly Director of the Royal Botanic Gardens, Ceylon.

"NO RUBBER MANUFACTURER WOULD BE WITHOUT IT."

[From the MECHANICAL FABRIC CO., Providence, Rhode Island.]

I have known THE INDIA RUBBER WORLD and your esteemed editor, Mr. Henry C. Pearson, for almost the life of the paper. It began in a modest way, but it was indispensable from the start on account of the attractive personality of Mr. Pearson and the confidence he so quickly won with the trade, together with the excellent paper he produced. No rubber manufacturer here or abroad would think of being without it. I was fairly young and inexperienced when I first met Mr. Pearson, but I found myself confiding in him very soon, and never knew him to betray my confidence or that of any one else.

There have been indeed great changes since THE INDIA RUBBER WORLD was started. With the exception of three or four, all of my associates are dead, and I am dictating this letter from a bed of sickness.

[Signed] A. L. KELLEY, *President*

"READ IT FOR 25 YEARS, ALWAYS WITH GREATEST PLEASURE."

[From RENÉ BOBET, consulting rubber engineer, Paris, France.]

You are about to celebrate the 25th anniversary of the foundation of your estimable journal, THE INDIA RUBBER WORLD. Permit me on this occasion to send you my hearty congratulations, with my best wishes for your prosperity. You will find my name on your books, among the subscribers from the first. I therefore assisted at the birth of your journal, which I have read for the last 25 years; always with the greatest pleasure. I have remarked how, thanks to your efforts, and the constant improvements you have made in all the details of editing, you have placed THE INDIA RUBBER WORLD in the first rank of similar journals throughout the entire world.

The whole of the rubber industry ought to appreciate your efforts thus crowned with success and to congratulate you on your work.

All honor to THE INDIA RUBBER WORLD and to its eminent director, Henry C. Pearson.

[Signed] R. BOBET.

"SUCCESSFUL WORK IN BEHALF OF THE RUBBER INDUSTRY."

[From the BOSTON BELTING CO., manufacturers, Boston, Massachusetts.]

Until the advent of THE INDIA RUBBER WORLD the rubber industry in the United States had no trade journal worthy of the name. The way in which your publication has grown in size, influence and amount of advertising patronage during the past 25 years is certainly a fitting and well merited recognition of your journal and its able and accomplished editor. There are

few publications in any field where the personality of the editor and publisher are so closely identified with the industry it serves as is the case of *THE INDIA RUBBER WORLD* and yourself. It is extremely rare for such a happy combination to continue for the rather remarkable period of 25 years.

In extending upon your silver anniversary my congratulations upon what you have accomplished, please also accept my best wishes for many more years of successful work in behalf of the rubber industry. With assurances of my best personal regards.

[Signed] THOMAS A. FORSYTH, *President*.

"ITS STERLING QUALITIES, ITS INDEPENDENCE AND IMPARTIALITY."

[From PHILIP SCHIDROWITZ, rubber chemist, London, England.]

In these horrific times of war and destruction the contemplation of any event representing the arts and crafts of peace, the best that man's energy, intellect and resource can accomplish in the furtherance of humanity's well being, is as an oasis in a vast and dreary desert.

The 25th birthday of *THE INDIA RUBBER WORLD* calls for something more than conventional congratulation; it calls for sincere felicitation and gratitude from all those who, like myself, have watched its progress, its success, and who have benefited from its sterling qualities as a journal, from its independence and impartiality. It is, I believe, a rare event for an editor to have founded and successfully conducted a great journal for a quarter of a century without a break. While congratulating you on the past, I hope that you may continue for very many years at the helm of a barque which has become a valuable asset to all of us who are interested in the rubber industry.

[Signed] PHILIP SCHIDROWITZ.

"ITS MARKEDLY USEFUL AND SUCCESSFUL CAREER."

[From the DAVOL RUBBER Co., manufacturers, Providence, Rhode Island.]

Upon the occasion of the celebration of the 25th anniversary of the birth of *THE INDIA RUBBER WORLD*, I beg leave to offer you, as its founder and Editor in Chief for the full quarter century of its markedly useful and successful career, the sincerest congratulations of this company and heartiest personal good wishes for its continued growth and prosperity.

[Signed] CHAS. J. DAVOL, *President and Treasurer*.

CONGRATULATIONS FROM GERMANY.

[From DR. HEINR. TRAUEN & SÖHNE, Hamburg, Germany.]

We learn that you are celebrating the 25th birthday of your esteemed paper and wish to express to you our heartiest congratulations for that happy event.

We are quite aware that the prosperous development of *THE INDIA RUBBER WORLD*, in which we found always plenty of interesting stuff for ourselves, is in the first place due to the constant and intelligent labor of the editor, Mr. Henry C. Pearson, and we therefore hope very sincerely that he may be on his place for many years to come.

[Signed] H. OTTO TRAUEN.

"OF GREAT VALUE TO THE RUBBER TRADE."

[From the E. H. CLAPP RUBBER Co., reclaimers, Boston, Massachusetts.]

We wish to extend our heartiest congratulations both to *THE INDIA RUBBER WORLD* and its editor, on the occasion of its 25th birthday. It gives us special pleasure to do this and we feel that *THE INDIA RUBBER WORLD* for 25 years under your editorship has been of great value to the rubber trade, in that we have always found that its news was reliable news.

The writer also wishes to extend his personal congratulations to you for the smiling and genial way you have always had of trying to make your friends enjoy life; also for your work in bringing the different rubber men into social intercourse so that they could find out what a good fellow the other man was.

[Signed] E. H. CLAPP, *Treasurer*.

GOOD WISHES FROM ENGLAND

[From CHAS. MOUNTSH & Co., Limited, Manchester, England.]

We heartily congratulate you, *THE INDIA RUBBER WORLD*'s original and present editor, and trust that you and your excellent paper may continue to enlighten the india rubber world for many years to come.

[Signed] R. K. BIRLEY, *Director*.

READ "REGULARLY AND SYSTEMATICALLY" IN CANADA.

[From THE MINER RUBBER Co., Limited, manufacturers, Grafton, Quebec.]

During the writer's comparatively short connection with the rubber business, he has found *THE INDIA RUBBER WORLD* of great assistance to himself and to our staff in keeping us posted as to the doings of that part of the business world upon which we are depending for our supplies of the wherewithal to make good rubbers. But going back even farther than this, when the writer was a comparative youngster, he remembers very well the great interest the late Mr. S. H. C. Miner, the founder of our business, took in your publication, and how regularly and systematically he looked forward to reading it and how much he missed it, whenever, through some slip in our postal department, its arrival was delayed.

We trust that the success which has attended your publication during the past 25 years will be more than doubled in the future.

[Signed] W. H. MINER, *General Manager*.

"OCCUPIES AN ENVIABLE POSITION."

[From the FARRER FOUNDRY & MACHINE Co., Ansonia, Connecticut.]

Having learned that *THE INDIA RUBBER WORLD* is to celebrate its 25th anniversary, we take this opportunity to congratulate you upon its success. We well remember when you first resolved to bring out a paper to be devoted to the interests of the rubber business, and your optimistic views of the future of this branch of business. It took some courage at that time to make the venture, and you may well take pride in its success. *THE INDIA RUBBER WORLD* occupies an enviable position among the trade journals, and has kept apace, we believe, with the remarkable development of the rubber business.

With best wishes for your continued success,

[Signed] FRANK E. HOADLEY, *Secretary*.

"ADDED IMMEASURABLY TO MAN'S KNOWLEDGE CONCERNING RUBBER."

[From the STANDARD ASPHALT & RUBBER Co., New York.]

I am glad I am here yet to congratulate you on the 25th anniversary of the advent of *THE INDIA RUBBER WORLD*.

You have certainly achieved a great success, and sometimes it is a question in my mind whether the *World* grew up with the rubber business, or whether the rubber business grew up with the *World*.

Anyhow, you have reason to be proud of your life's work, and can truly felicitate yourself, as having in 25 years added immeasurably to the sum of man's knowledge concerning india rubber.

May you "live long and prosper."

[Signed] GEO. WATKINSON.

"AN AUTHORITY ON ALL MATTERS PERTAINING TO RUBBER."

[From the BOWERS RUBBER Works, manufacturers, St. Louis, Mo.]

The Bowers Rubber Works and many of its employees, who read your interesting journal, wish to most heartily congratulate you on the happy event that marks the 25th anniversary of the publication of *THE INDIA RUBBER WORLD*. Your paper is looked for and consulted as an authority on all matters pertaining to rubber.

I am sure that the splendid success already attained will continue a very long time, and, as for you personally, may your years be as many as your friends are numerous.

[Signed] W. F. BOWERS, *President*.

News of the American Rubber Trade.

THE ADAMSON MACHINE CO. STILL GROWING.

THE Adams Machine Co., of Akron, Ohio, was started in 1892 by Alexander Adamson. Fourteen years later it was incorporated. The company's plant has been increased steadily from time to time. Five years ago it built an entirely new plant, with a floor area of 45,000 square feet. Since that time this has been increased considerably over 100 per cent, so that its floor area now amounts to 110,000 square feet, and with the addition now building 135,000 square feet.

THE UNITED STATES TIRE CO. CONCENTRATES ITS WORK.

The United States Tire Co. was formed in 1911 to market four of the best known brands of tires, namely: Morgan & Wright, made at Detroit; the Hartford, made at Hartford, Connecticut; the G & J, made in Indianapolis; and the Continental, made by the Revere Rubber Co., Providence, Rhode Island. For about a year these tires were sold under their individual names. Then the four brands were eliminated, or at least subordinated, and all the tires were sold under the general brand, United States Tire Co. Now in order to manufacture with greater economy and better facilities for specialization, the company intends to concentrate the manufacture of automobile tires in two of its plants, namely, those at Hartford and Detroit, while all its bicycle and motorcycle tires will be made at the Indianapolis plant and the solid tires, for motor trucks, carriages and other vehicles, will be manufactured in the Revere plant at Providence.

NO INCREASE IN PIANO TUBING PRICES.

The Chicago correspondence which appeared in a recent number of this publication spoke of the advance in the price of rubber tubing for player-pianos. Such an advance took place soon after the outbreak of the war and the phenomenal rise in crude rubber prices, but in some cases the prices for tubing have been restored to their original figure. The L. J. Mutty Co., of Boston, for instance, advanced its price for piano rubber tubing 10 per cent early in the fall, but reduced the figure again to the original price on the first of November; and all its customers who had contracts were fully protected during the period covered by the advance. No increase in price was made in its line of rubber coated cloths.

RUBBER COMPANY DIVIDENDS.

The Board of Directors of the Rubber Goods Manufacturing Co. on December 2 declared a sixty-third regular quarterly dividend of 13 1/4 per cent on the preferred stock of the company, and a dividend of 1 per cent on the common stock—both payable December 15 to stockholders of record on December 10.

The Kelly-Springfield Tire Co. has declared quarterly dividends of 1 1/2 per cent on the 6 per cent preferred stock of the company and 13 1/4 per cent on the 7 per cent preferred stock—payable January 2 to stockholders of record on December 15; also a dividend of 1 1/2 per cent on common stock, payable February 1 to stockholders of record on January 15. This is the first dividend declared by the company on its common stock, which two years ago sold at 15 and is now in the neighborhood of 70.

The Converse Rubber Shoe Co., of Malden, Massachusetts, on December 1 paid a regular semi-annual dividend of 3 1/2 per cent on preferred stock to stockholders of record on November 25.

The Firestone Tire & Rubber Co., of Akron, Ohio, has declared a quarterly dividend of 13 1/4 per cent on its preferred stock and a dividend of 3 per cent on common stock, payable January 15 to stockholders of record on December 31.

The Apsley Rubber Co., of Hudson, Massachusetts, has declared a regular semi-annual dividend of 3 1/2 per cent, payable January 1 to stockholders of record on December 28.

TRADE NEWS NOTES.

Beginning January 1, the Boston Woven Hose & Rubber Co., at its plant in Cambridge, Massachusetts, will reduce the working hours of all employes in its factory from a 10 and 11 to a nine hour basis per day. This reduction in hours will not mean a reduction in wages to the operatives, as they will receive the same total wage per week for the shorter hours that they have heretofore received.

The Keystone Rubber Manufacturing Co. has built a \$50,000 addition to its plant at Erie, Pennsylvania, increasing its capacity about four times. The company intends to make a specialty of red and gray inner tubes.

The L. J. Mutty Co., which manufactures rubber fabrics and tubing, has moved its executive offices from 93 Federal street to 175 Congress street, Boston.

The St. Louis branch of Fisk Rubber Co., of Chicopee Falls, Massachusetts, will remove about April 1 from its present quarters at 3917 Olive street, to the 2-story and basement fireproof building now under erection at 2206 Locust street, on which a long time lease has been taken.

The American Rubber Fabric Co. has under way a 6-story fireproof concrete addition to its plant at Pittsburgh, which, when new machinery is installed, the company states will constitute one of the best equipped rubberizing plants in the country. This company produces a line of rubber hospital sheeting, raincoat cloth, automobile top cloth and many other rubberized fabrics.

The tire tread and repair stock, cement, etc., of the Stoddard Rubber Co., of Worcester and Millville, Massachusetts, is now on sale in New York City, by the Stoddard Rubber & Tire Co., of 177 Broadway.

The Marathon Tire & Rubber Co., of Cuyahoga Falls, Ohio, in a letter recently received, states that arrangements have been made by which Marathon tires will be made in Canada by a firm at St. Catharines, Ontario, under the trade name and subject to the supervision of the Marathon company. The erection of a plant there has been abandoned for the present.

The Detroit Insulated Wire Co., of Detroit, Michigan, has increased its capital stock from \$100,000 to an authorized issue of \$500,000, of which on December 4 \$250,000 was outstanding. Its manufacturing facilities are being improved and increased, and new buildings and machinery provided.

The Searle Unburstable Inner Tube Co. has been incorporated in New York, with a capital stock of \$400,000, to manufacture the Searle automobile inner tube. The incorporators are Orson Kilborn, Frederick H. Hall and J. Campbell Thompson, all of New York.

The Wellington Rubber Co., of Medford, Massachusetts, was petitioned into bankruptcy on December 15, with liabilities amounting to \$100,941, and assets \$43,754.

The East Palestine Rubber Co. has moved its executive offices from 200-2 Wood street to 439 Sixth avenue, Pittsburgh.

The Summit Rubber Co., of Barberton, Ohio, which is in the hands of receivers, states that it will not resume rubber manufacture.

A factory is being established in the outskirts of London by Johnson & Johnson, of New Brunswick, New Jersey, makers of surgical appliances, rubber bandages, plasters, etc. The factory at New Brunswick has been kept in continuous operation night and day for the past three months, filling orders for French and British hospitals, requisitions for five tons of bandage at one time being nothing unusual.

ADJUTANT TRUMBULL WARREN.

TRUMBULL WARREN, president of the Gutta Percha & Rubber, Limited, of Toronto, Canada, is one of the patriotic Canadians who are now at the front. As a youth he received considerable military training, and, as lieutenant in the Forty-eighth Highlanders, he was one of the first to respond to England's call for men. On his arrival in England he was at once appointed Assistant Adjutant on the Headquarters Staff and detailed for duty at Salisbury Plain. Mr. Warren, although in reality an enthusiastic Canadian, is very nearly a Yankee. His father, the late H. D. Warren, was a New Yorker who went to Toronto in 1887. There he at once took a prominent part in the business and social life of that busy city. He brought up his three sons, not as Canadians or Americans, but as sturdy, self-reliant citizens of the world. He also trained them in the important rubber business that he built, so that at the time of his passing the eldest son was able to take his place as president of the company. When the call to arms came he felt it "a duty" and at once responded. In the same spirit the two younger sons, H. D., Jr., and Frederic Alden, are working hard to fit themselves for service should the call come.

A TREAD OF "VITALIZED" RUBBER.

The Vitalite Rubber Co., whose offices are in the Woolworth building, New York, is putting out a tire with a new "vitalized" rubber tread, regarding which it speaks as follows in a little booklet recently issued: "Our chemist has produced a tread stock of a new compound in which nearly all the sulphur has been eliminated. This compound will vulcanize before the duck and friction are burned by the high heat, as perhaps you know there is a limit to the time that duck can be left in the heat without its being ruined. We have produced a tread that is very much tougher than any other tire on the market."

RUBBER COMPANY SHARE QUOTATIONS.

The following market quotations of the shares of rubber manufacturing companies on December 28, 1914, are furnished by John Burnham & Co., 31 Nassau street, New York, and 41 South La Salle street, Chicago.

	Bid.	Asked.
Ajax-Grieb Rubber Co., common	250	...
Ajax-Grieb Rubber Co., preferred	100	...
Firestone Tire & Rubber Co., common	348	352
Firestone Tire & Rubber Co., preferred	110	112
The B. F. Goodrich Company, common	23	25
The B. F. Goodrich Company, preferred	91	95
Goodyear Tire & Rubber Co., common	190	192
Goodyear Tire & Rubber Co., preferred	102	104
Kelly-Springfield Tire Co., common	65	68
Kelly-Springfield Tire Co., new 1st preferred..	75	79
Kelly-Springfield Tire Co., new 2nd preferred.	93	97
Miller Rubber Co.....	160	...
Portage Rubber Co., common.....	25	30
Portage Rubber Co., preferred.....	80	85
Swinehart Tire & Rubber Co.....	69	70
United States Rubber Co., common.....	51	53
United States Rubber Co., 1st preferred.....	100	102

PERSONAL MENTION.

Thomas O'Callaghan, Jr., has been appointed New York branch manager of the Empire Rubber & Tire Co., of Trenton, succeeding T. B. Todd, who recently resigned to become associated with Marshall, Wood & Co., automobile supply dealers at Plattsburgh, New York.

Richard F. Foote, factory manager and an officer of the Independent Rubber Co., of Merritton, Canada, was recently in New York and reported conditions as normal, with good prospects for increased business in army footwear.

C. D. Studebaker has been placed in charge of the New York office of the Firestone Tire & Rubber Co. Mr. Studebaker has been associated with the tire industry for a number of years, first with the Diamond Rubber Co. and later with the Walpole Tire & Rubber Co., joining the Firestone forces about a year ago.

J. J. Jordan, former manager of the Firestone company's New York branch, has gone to Europe with a view to increasing the foreign sale of Firestone tires.

R. W. White has been promoted from the management of the Columbus, Ohio, branch of the Goodyear Tire & Rubber Co. to a similar position with the Chicago branch. His successor at Columbus is W. W. Magill.

A. A. Templeton, vice-president of the Morgan & Wright Tire Co., of Detroit, Michigan, has been elected president of the Transportation Bureau of the Great Lakes Waterways Conference.

Charles Holden, of the Canadian Consolidated Rubber Co., Limited, Winnipeg, Manitoba, has been elected president of the Northwestern Commercial Travellers' Association of Canada, for the year 1915.

L. Greenwold, of Ashland, Ohio, has been appointed to the management of the Santiago, Porto Rico, branch of the Firestone Tire & Rubber Co.

At the annual meeting of the New England Shoe Wholesalers' Association, held December 9, at Young's Hotel, Boston, Mr. Fred C. Hood, general manager of the Hood Rubber Co., made an address on the contractual relations between shoe wholesalers and rubber companies, incidentally referring to the present condition of the crude rubber market and its principal tendencies.

Among those recently appointed by the Akron Chamber of Commerce to local committees are—F. A. Seiberling, head of the Goodyear Tire & Rubber Co., chairman of the street railway committee and also a member of the water committee; I. R. Bailey, department manager of the Goodyear company, municipal committee; Francis Seiberling, chairman of the entertainment committee.

C. D. Studebaker has been promoted from the sales force of the Firestone Tire & Rubber Co. to the management of the New York office.

Henry Plow, at one time treasurer of the Hartford Rubber Works Co., of Hartford, Connecticut, and later associated with the automobile industry, which he represented in London and Paris, has become sales manager and second vice-president of the Midgley Tire & Rubber Co., of Lancaster, Ohio.



TRUMBULL WARREN.

COMPANY FORMED TO EXPORT RUBBER GOODS.

LATE in November the United States Rubber Export Co., Limited, was formed, for the purpose of concentrating and bringing under one control all the export business of the United States Rubber Co. On December 2 the incorporators of the new company met at the building of the United States Rubber Co. and completed the organization. The following board of directors was elected: Samuel P. Colt, president of the United States Rubber Co.; Lester Leland and James B. Ford, vice presidents of that company; Elisha S. Williams, president of the Rubber Goods Manufacturing Co., and Homer E. Sawyer, general manager of the United States Rubber Co., also Raymond B. Brice, Charles C. Case, William E. Barker, Joseph C. Weston, Edward H. Huxley, H. Stuart Hotchkiss and William J. Maloney.



EDWARD H. HUXLEY.

The directors organized by electing the following officers: President, Edward H. Huxley; treasurer, W. G. Parson, who is also treasurer of the United States Rubber Co.; assistant treasurer, H. Stuart Hotchkiss, and secretary, John D. Carberry, who is also assistant secretary of the United States Rubber Co. and the Rubber Goods Manufacturing Co.

Edward Huxley, the president, has long been identified with the rubber business. At the time of the reorganization of the Boston Woven Hose & Rubber Co. he was one of A. M. Paul's right hand men. In 1911 he became assistant general manager and sales agent of the National India Rubber Co. Later he came to New York for the United States Rubber Co. and devoted himself to the export field. In this line he has proved himself an expert, becoming an encyclopedia of information on commercial geography, tariffs, trade routes, etc.

THE GREAT EASTERN RUBBER CO.

The Great Eastern Rubber Co., Inc., has been organized at Allentown, Pennsylvania, and incorporated under the laws of that state to manufacture, sell and distribute automobile tires and other rubber goods. The capitalization of this concern is \$100,000—650 shares of 7 per cent. cumulative preferred and 350 shares of common stock—the organizers having purchased the common and turned over to the company \$13,500 in cash, with equipment and stock valued at \$24,000, as well as a patent covering the "Crown" tire which it is their purpose to manufacture, operating a factory at Allentown. The special claims for this tire are that it has two more layers of fabric than any other tire, that its resiliency point is at the side instead of at the bead, and that it has an extra heavy tread. The officers are: V. A. Nagle, president; D. M. Knabb, vice-president; Charles R. Fluck, treasurer; A. E. Dodge, secretary. Messrs. Nagle and Dodge are experienced tire men, and Charles Sullivan, the factory manager, has long been associated with tire manufacture.

BOSTON BELTING CO.

The following is a condensed summary of the September 30 balance sheet of the Boston Belting Co.:

LIABILITIES.	
Capital stock	\$1,000,000.00
Reserve fund	800,000.00
Profit and loss	46,918.69
Notes payable	200,000.00
Unsettled bills	31,401.50
ASSETS.	
Real estate, land and buildings.....	\$351,256.01
Water privilege	150,000.00
Machinery	269,763.28
Tools, furniture and fixtures	107,876.76
Cash	53,693.94
Bonds receivable; notes receivable {	650,544.83
Investment Acct.; accts. receivable }	
Merchandise	495,035.37
Trade marks, etc.	150.00
	\$2,078,320.19 \$2,078,320.19

ALEMBIC GUM.

In spite of the explosions and their fatal results, noted in recent numbers of THE INDIA RUBBER WORLD, the Alembic Process Co., Perth Amboy, New Jersey, is still at work on its synthetic rubber. Rumor has it that it is made from turpentine and costs but 12 cents per pound. A professor of chemistry at Wesleyan University is said to have examined the process and reported favorably upon it.

A RUBBER RETAILER CELEBRATES HIS 25th ANNIVERSARY.

THE INDIA RUBBER WORLD is not the only institution connected with the American rubber trade that has recently celebrated its 25th anniversary. Howe's Rubber Store, situated in Central Square, Lynn, Massachusetts, started in business in December, 1889, and has just celebrated the completion of its 25th year. As a souvenir of this event it has distributed a little pocket memorandum book in which the reason of its success is described as follows: "This is largely due to our invariable policy of seeking quality and worth, rather than the prevalent disposition of our present day retailers—low prices."

PINES RUBBER CO. TO DO RUBBERIZING FOR THE TRADE.

The Pines Rubber Co., Inc., has purchased the business of the Anglo-American Rubber Corporation, situated at Bush Terminal building No. 19, Brooklyn. The incorporators are Joseph, David and Morris Pines, who are also proprietors of the Pines Manufacturing Co., of 55 West Twenty-sixth street, New York, which manufactures raincoats. The Brooklyn plant is being utilized for the rubberizing of fabrics for the Pines manufacturing concern, and will soon be in a position to also do rubberizing for the trade.

CLEVELAND FACTORY TO BE USED AS RUBBER WORKS.

The Standard Tire & Rubber Co. has purchased land and buildings at Cleveland, Ohio, formerly occupied by the American Fork & Hoe Co., and are making the necessary alterations to convert the plant into a rubber factory. This purchase includes two 2-story buildings respectively 360 x 120 and 300 x 60 feet and a 2-story wing 90 x 35 feet, with separate buildings for engines, boilers, etc. The capitalization of the company, at present \$100,000, is soon to be increased. The product will consist of solid tires, pneumatic tires and tubes and mechanical rubber goods, and the factory, which will probably not be ready for operation before July next, will be equipped to turn out about 500 tires per day. Its specialty will be the "Flex Steel" inner tire, a device composed of steel and rubber (both made from secret formulas in the possession of the company) and of fabric. The company's officers are: M. J. Gillen, president; George G. Russell, vice-president; C. F. Groth, treasurer; Charles B. Shaw, secretary. These officers, with E. L. Thompson, J. F. Schulte, E. W. Silver, L. R. Adams and Dr. J. V. Gallagher, compose the board of directors.

PURCHASING AGENT ROSWELL C. COLT.

THE day of infallible prophecy being past, it is quite hazardous to predict now what will take place some years from now. It would be venturesome, for instance, to predict that Mr. Roswell C. Colt, recently made purchasing agent of the Canadian Consolidated Rubber Co., Limited, would some day occupy the position now graced by his distinguished father, who is president of the largest rubber manufacturing company in the world.



ROSWELL C. COLT.

But it would not be venturesome to predict that young Mr. Colt will arrive at some highly desirable goal in the rubber manufacturing industry and for three good reasons: He has a fine start; he is headed the right way, and he is going strong.

He graduated from Harvard in 1910. It is safe to say that he might have stepped into something quite comfortable, with a mahogany desk and office boy with buttons, if he had applied for it, but he didn't. He went to Canada, bought a

pair of overalls and got a job with the Canadian Consolidated Rubber Co., Limited. He started for Winnipeg and began to hustle cases in the company's big warehouses at that place. This kept his muscles hard and incidentally gave him a chance to get acquainted with the system of distribution employed by a large manufacturing concern.

Four months later, after having mastered the distribution problem, he returned to the factory to learn how goods were made. The most important and one of the most difficult articles to make in a rubber factory is the automobile tire, so he got another pair of overalls and began tire making, working from 7 a. m. to 6 p. m. When he had reached the point where he could make as good a tire as anyone he began to look around to see what material was used in the factory, and why, and how much, and what it cost and where it came from; and in due time he was equipped to drop tire making and take up the buying of supplies, so they have made him purchasing agent.

All this in less than four years' time. Not a bad start!

S. A. E. MEETING JANUARY 5-7.

The annual meeting of the Society of Automobile Engineers will be held in the auditorium of the Engineering Societies' building, at 29 West Thirty-ninth street, January 5-7. The program includes papers on a number of interesting subjects, among which is one, scheduled for Wednesday evening, January 6, by C. B. Whittelsey, secretary and factory manager of the Hartford Rubber Works Co., of Hartford, Connecticut, on "Pros and Cons of Correct Tire Inflation." This paper and the discussions it leads to are expected to assist in the solution of the problem of proper tire inflation as associated with tire loads and sizes, which has been engrossing the attention of the standards committee of the association for some time.

TRADE NEWS NOTES.

The new offices of the Rubber Trading Co. in the Postal Telegraph building, corner of Broadway and Warren street are a move in the right direction; that is, they are more easily found by the trade. The building is modern and the customers' room is a large apartment adjoining a large sample room. Not only that, but in the top of the building is the famous mahogany Club, where so many of the downtown rubber men are wont to lunch.

The S. A. P. Co., 327 Produce Exchange, New York, informs The INDIA RUBBER WORLD that in its investigation of vegetable oils used in rubber manufacture great differences in purity are found. For this reason the company has established a department of examination, which is in charge of an expert chemist, so that absolutely pure oils of any sort can be assured.

The New York agency of the Russian French India Rubber, Gutta-percha & Telegraph Works, Riga, Russia, advises The INDIA RUBBER WORLD that it has been completely cut off from its source of supplies for the present. This agency informs us that the factory is running fully, the output being required for government use. It is hoped soon, however, to have government permission for the continuation of export of rubber goods from Russia.

On December 1 there was in bonded warehouses in New York 348,974 pounds of chicle, valued at \$117,903; manufactures of gutta percha to the value of \$91,419; india rubber manufactures worth \$70,878, and of elasticon \$606. The records for December 1, 1913, give the value of chicle in bond on that date \$63,976; manufactures of gutta percha, \$86,750; manufactures of india rubber, \$45,440.

The Vulcanized Rubber Co., of Morrisville, Pennsylvania, which manufactures hard rubber goods, is increasing its plant by the addition of a building for the storing of scrap rubber.

The Canadian government has forbidden the export of rubber from Canada to any country other than part of the British empire. The commerce of Canada in rubber goods has in the past amounted to about \$4,500,000 annually, of which amount exports have represented approximately \$500,000.

On December 1 the Federal Rubber Manufacturing Co., of Milwaukee, Wisconsin, announced a reduction in price on its rugged tread tire casings, in sizes from 30x3 inches to 36x5 inches, amounting to from \$4.40 to \$7.95 per tire.

Fire recently damaged the storehouse of the Converse Rubber Shoe Co., of Malden, Massachusetts, to the extent of about \$10,000, a loss fully covered by insurance.

The Gilney Tire & Rubber Co., of 250 West Fifty-fourth street, New York, has reduced its capital stock from \$100,000 to \$50,000.

The offices of the New York Shield Co., which manufactures the "Amolin" shield, were removed on December 1 to 19-25 East Twenty-fourth street, New York.

Some good-sized contracts for fire hose have recently been awarded in western cities, The B. F. Goodrich Co., of Akron, Ohio, having secured an order for 9,000 feet from the fire department of Minneapolis, Minnesota; the Manhattan Rubber Manufacturing Co., of Passaic, New Jersey, a contract for 5,000 feet from the city of St. Paul, Minnesota, and the C. C. C. Fire Hose & Rubber Co., of Canton Junction, Massachusetts, an order for 1,000 feet to equip the department at Eau Claire, Wisconsin.

The Habirshaw Wire Co. has removed its sales office to its general headquarters at Yonkers, New York.

The Franco-American Rubber Cloth Co. has opened a factory at Como, New Jersey.

On and after January 4, 1915, The Charles T. Wilson Co., Inc., of New York City, will maintain an office at Room 507, Second National Building, Akron, Ohio, in charge of Henry Perlish, vice-president of the company.

NEW INCORPORATIONS.

Anderson Pneumatic Spring & Tire Co., November 27, 1914; under the laws of Delaware; authorized capital, \$1,000,000. Incorporators: William W. Anderson, George A. Rock and Samuel T. Dorsett—all of Washington, D. C. The company is to acquire and take over from James C. Anderson, of Washington, D. C., an exclusive license granted by the United States, so far as it relates to pneumatic springs, starters, brakes and tires for automobiles and other vehicles.

Anti-Puncture Corporation, December 9, 1914; under the laws of New York; authorized capital, \$20,000. Incorporators: Chas. H. Stanton, 105 Beverly Place, Brooklyn, New York; Myra Emmons, 804 West One Hundred and Eightieth street, and Sidney V. Morris, 302 West Twenty-second street—both in New York City. To manufacture compositions for preventing punctures in tires, etc.

Bucyrus Rubber Co., The, December 2, 1914; under the laws of Ohio; authorized capital, \$150,000. Incorporators: G. B. Smith, Jay Taylor, H. B. Stewart, Ed. L. Smith, and Isaac H. Taylor. To manufacture and deal in rubber goods.

Community Rubber Co., November 20, 1914; under the laws of New Jersey; authorized capital, \$25,000. Incorporators: P. S. Martinett, J. R. D. Bower and H. S. Allen—all of Trenton, New Jersey. To manufacture, purchase, sell and deal in all kinds of rubber goods and articles in which rubber is a part.

Dixie Tire & Rubber Co., October 3, 1914; under the laws of New Jersey; authorized capital, \$10,000. Incorporators: Carrie M. Downing, Charles J. Downing—both of Vaux Hall—and Frederick B. Taylor, South Orange—all in New Jersey. To deal in and sell automobiles, vehicles and accessories of every kind.

Dujardin Rubber Co., Inc., December 7, 1914; under the laws of New York; authorized capital, \$100,000. Incorporators: Henry Dujardin, 3303 Glenwood Road, Brooklyn, New York; Frank B. Hutcheon and Frank E. Hutcheon—both of 205 Avenue A, Bayonne, New Jersey. To manufacture tires, tubes, rubber goods, etc.

Eastern Tire & Supply Co., of Rochester, N. Y., Inc. December 8, 1914; under the laws of New York; authorized capital, \$5,000. Incorporators: James G. Barclay, Buffalo; Wm. T. Kineag and Arthur Smith—both of Rochester, New York. To manufacture tires and auto accessories.

Empire Wheel & Tire Co., November 9, 1914; under the laws of Alabama; authorized capital, \$2,000. Incorporators: J. W. Gannon, W. S. Webber, F. H. Elmore, Jr. Principal place of business, Montgomery, Alabama. To deal in auto tires, etc.

Ford Tire & Tube Co., The, November 14, 1914; under the laws of Ohio; authorized capital, \$10,000, divided into one hundred shares of \$100 each. Incorporators: E. E. Rodd, C. V. Liggett, U. L. Henzy, C. A. Levy and Lee Ulmer. To manufacture and sell rubber tires and tubes for automobiles.

Germantown Almegum Manufacturing Co., July 15, 1914; under the laws of Pennsylvania; authorized capital, \$10,000. Incorporators: John Axford, 343 E. Chelten avenue; William B. Keefer, Newport Apartments; Frank M. Camp, 321 Lincoln avenue, and J. L. McGiehan, 405 Lexington avenue—all in Philadelphia, Pennsylvania. To manufacture and sell mechanical rubber goods.

Gibraltar Tire & Tube Co., December 16, 1914; under the laws of New Jersey; authorized capital, \$100,000. Incorporators: Harry L. Brown, William Seale, Randolph Bradshaw and Raymond Brown—all of Newark, New Jersey. To manufacture and sell automobile tires, tubes and rubber of every character and description.

Gillette Safety Tire Co., The, November 21, 1914; under the laws of Maine; authorized capital, \$1,000,000. Incorporators: Albert F. Jones, T. L. Groteau, A. B. Farnham, Clarence G.

Trott—all of Portland, Maine. To sell and deal in rubber or similar substances.

Great Eastern Rubber Co., November 19, 1914; under the laws of Pennsylvania; authorized capital, \$100,000. Incorporators: Charles R. Fluck, Daniel M. Knabb—both of Allentown—and Van A. Nagle, Easton—all in Pennsylvania. To manufacture and sell rubber tires and other articles of commerce of which rubber is an ingredient.

Johnson Pneu-Metal Tire Co., October 2, 1914; under the laws of Massachusetts; authorized capital, \$1,000,000. Incorporators: Fred I. Johnson, Prospect street, Fitchburg; James H. Duffy, 18 Tremont street, and William P. Meehan, Boston—all in Massachusetts. To manufacture and deal in tires, etc.

McClurg Rubber Co., The, November 23, 1914; under the laws of Ohio; authorized capital, \$250,000. Incorporators: John S. McClurg, James L. McClurg, Wm. Z. Davis, W. A. Hinebaugh and O. D. Tucker. To manufacture, sell and buy at wholesale and retail rubber tires for automobiles.

Mircho Specialty Co., Inc., December 16, 1914; under the laws of New York; authorized capital, \$3,000. Incorporators: Arthur C. Squires, Keyport, New Jersey; Jacob A. Lewis, 4633 Park avenue, New York, and Paul H. Allen, 45 West Thirty-fourth street, New York City. To manufacture rubber goods.

Motor & Tire Sales Co., December 14, 1914; under the laws of Delaware; authorized capital, \$100,000. Incorporators: Herbert E. Latter, William J. Maloney, Oscar J. Reichard—all of Wilmington, Delaware. To manufacture and deal in automobiles, motor cars, etc., as well as to repair tubes and automobiles.

Overman Cushion Tire Co., Inc., December 2, 1914; under the laws of New York; authorized capital, \$150,000. Incorporators: Mac C. Overman, 250 West Fifty-fourth street; Charles A. Tausig, 220 Broadway, and Wm. R. Lowther, 43 Cedar street—all of New York City. To manufacture tires, rims and other auto accessories.

Para Products Co., Inc., The, September 10, 1914; under the laws of New Jersey; authorized capital, \$5,000. Incorporators: Jacob Schreiber, 149 Broadway; Alfred Epstein, 1777 Broadway, and Frank Brown—all of New York City. To manufacture, purchase and sell rubber goods and all goods of which rubber is a component part.

Pines Rubber Co., Inc., December 16, 1914; under the laws of New York; authorized capital, \$1,000. Incorporators: Jos. Pines, 1221 Forty-second street; David Pines, 364 Hopkinson avenue, and Morris Pines, 1254 St. Marks avenue—all of Brooklyn, New York. To manufacture raincoats, rubberized materials, etc.

Searle Unburstable Inner Tube Co., Inc., The, December 9, 1914; under the laws of New York; authorized capital, \$400,000. Incorporators: Frederick H. Hall, Hotel Astor; Orson Kilborn, 316 West Seventy-eighth street, and J. Campbell Thompson, 63 Wall street—all of New York City. To manufacture inner tubes and tires, etc.

Service Tire & Rubber Co., October 14, 1914; under the laws of Maryland; authorized capital, \$10,000. Incorporators: James L. Clifford, Joseph W. Clifford, James J. Filon, J. W. Evans and Catherine Clifford—all of Baltimore City, Maryland. To manufacture, purchase, sell, repair and otherwise deal in rubber and rubber goods of all kinds, and especially tires of every character and description.

Three Star Tire Co., December 10, 1914; under the laws of New Jersey; authorized capital, \$50,000. Incorporators: Edward H. Steel, 1102 West State street; Archibald F. Updike, 240 East Front street, and Richard G. Whitehead, 921 Berkley avenue—all in Trenton, New Jersey. To buy, sell and deal in rubber tires and tubes, etc.

Stern Co., David F., November 5, 1914; under the laws of New York; authorized capital, \$5,000. Incorporators: David F. Stern,

210 West Forty-fourth street; J. H. Halfbey and Isidor Lobatto—both of 1053 Southern Boulevard—all in New York City. To deal in boots, rubber shoes, etc.

Wire Tire Co., November 28, 1914; under the laws of Delaware; authorized capital, \$1,000,000. Incorporators: John S. Lyons, 412 North Main street; George L. Brown, 40 North Main street; both of Wilkes Barre; and Thomas A. Zukoski, Plymouth, all in Pennsylvania. To manufacture and sell automobiles, automobile tires, rims or accessories.

X Protectyre Co., Inc., The, November 21, 1914; under the laws of New York; authorized capital, \$20,000. Incorporators: Isidore Neustaedter and Hyman J. Rosenbloom—both of 63 Park Row; and Alfred Alexander, 50 West One Hundred and Eleventh street—all of New York City. To manufacture tire protecting devices and other auto accessories.

BUSINESS ACTIVE WITH CONVERSE CO.

According to its monthly statement for November, the Converse Rubber Shoe Co., of Malden, Massachusetts, is making 9,000 pairs a day against 6,000 pairs in November, 1913. The company having refused to bid on foreign orders for this season, the increase is solely attributable to home demands. It has been found necessary to operate many departments night and day.

TRADE NEWS NOTES.

Rubber footwear prices, which for the past two years have been announced in January, and prior to that time were published in April, are not yet ready. The "Boot & Shoe Recorder," in its issue of December 12, states that new price lists will be issued March 1.

At the meeting of the Retail Shoe Association of Louisville, Kentucky, the subject of profits to be obtained on rubbers was discussed, some dealers maintaining that rubbers selling at wholesale for 65 cents per pair should be retailed at \$1.25, while others claimed that a price of \$1 per pair—which would give the dealer a profit of 31 per cent. on the selling price and of 44 per cent. on the cost price—would encourage the public to buy more freely.

Large orders are being received by Canadian manufacturers for rubber shoes for the Allied armies. The Canadian Consolidated Rubber Co., Limited, of Montreal, has received an order for over 60,000 pairs of two-buckle arctics, through representatives of the British government, and practically all the rubber shoes in stock at the warehouse of this company and the branch in that city of the Gutta Percha & Rubber, Limited, have been bought for immediate shipment.

The Loewenthal Co. has removed its New England office from Chelsea, Massachusetts, to 161 Summer street, Boston.

The plant of the Leicester Rubber Co., at Catasauqua, Pennsylvania, damaged by fire last summer, was sold by the receivers on November 24 at \$5,900, the machinery bringing \$4,800 and the site and what remains of the building \$1,100.

Fire recently damaged the plant of the United States Rubber Reclaiming Co., at Buffalo, to the extent of about \$75,000. This plant was valued at \$1,000,000, and the fire is supposed to have been caused by spontaneous combustion.

The United States Rubber Co. has opened a new branch store at Indianapolis, Indiana, in charge of J. H. Hassett, formerly of the Banigan Rubber Co.'s Chicago force and also at one time connected with the New England Rubber Shoe Co., at Boston.

Fred Becht, who for a number of years was connected with the Goodyear's India Rubber Selling Co., has been appointed manager of the Maumee Rubber Co., at Toledo, Ohio.

An organization known as the Federal Goodfellowship Club, composed of employees of the Federal Rubber Manufacturing

Co., of Milwaukee, was instrumental in bringing Christmas cheer to a number of the less fortunate of that city during the holidays. This club had envelopes distributed among the employees on pay days for some time prior to Christmas, and each contributed what he could conveniently spare toward the cause.

The regulations under schedule B of the Emergency Revenue law, operative on and after December 1, 1914, provide that on chewing gum or substitutes therefor stamps must be affixed by the manufacturer before packages leave the factory, at the rate of 4 cents for every dollar's worth of gum at retail price; and that a label showing the number of tablets in the package with the retail price of each tablet, must also be affixed.

The Plymouth Rubber Co., of Canton, Massachusetts, has recently contracted with the Edison Electric Illuminating Co., of Boston, for a supply of energy equal to about 1,000 horse power for 24 hours per day, and amounting to about \$40,000 a year.

An announcement has been received to the effect that Messrs. Harold van der Linde and Victor van der Linde have severed their connection with the Century Rubber Co., of Plainfield, New Jersey.

Some interesting figures have been compiled by the Federal Rubber Manufacturing Co., of Milwaukee, Wisconsin, in regard to its output of tires for baby carriages. The quantity of this material sent out from the factory in October was sufficient to equip 88,000 baby carriages, which, at 12 feet of tire per carriage, would require 1,056,000 feet, or 200 miles.

A ruling of the Circuit Court of Appeals in the case of the L. E. Waterman Co., of New York, against the Modern Pen Co., both manufacturers of fountain pens, has been affirmed by the Supreme Court, which holds that there is no proprietary interest in the name Waterman, and that the Modern Pen Co., with which Arthur A. Waterman is associated, may mark its wares "Arthur A. Waterman & Co." Not connected with the L. E. Waterman Co.

The rubber stamp making establishment of R. A. Stewart & Co., Inc., at 203 Broadway, New York, was severely damaged by the fire which recently destroyed the three upper floors of the five-story building at that address.

The B. F. Goodrich Co., of Akron, is one of the rubber concerns that has profited from the season's big grain crops, having filled a great many orders for their "Longlife" and "Maxecon" conveyor belts for use in western elevators. Some of these belts are 715 feet long and 40 inches wide.

A meeting of stockholders of the Northland Rubber Co., Inc., which manufactures pneumatic tires and tubes, was held at the company's office at 703 Northland avenue, Buffalo, on November 17, when the following directors were elected: B. L. Jones [president]; G. C. Riley [secretary], and C. O. Henderson, for three years each; W. F. Kasting [vice-president], H. D. Miles and C. L. Ingham, for two years each; J. E. Ferguson, C. B. Hill and J. Jolly [assistant treasurer] for one year each.

The El Paso Rubber Vulcanizing and Auto. Supply Co., of El Paso, Texas, has filed certificates of dissolution.

A convention of the National Foreign Trade Council, of which James A. Farrell is chairman, will be held at the Planters' Hotel, St. Louis, Missouri, January 21 and 22.

The Motor Truck Club of America held its annual meeting and banquet on Wednesday evening, December 16, at the Automobile Club of America, New York. The club now has 344 members, representing all the various industries associated with truck manufacture and operation, its membership including 15 tire manufacturers and 9 tire salesmen. At this meeting George H. Duck, of the Sewell Cushion Wheel Co., was elected a director for a three-year term.

THE RUBBER TRADE IN AKRON.

By J. J. Anderson, Correspondent.

THE 10 per cent increase in freight rates granted Eastern railways December 18 by the Interstate Commerce Commission will result in stimulating the local rubber trade, was the statement made, when interviewed, by F. A. Seiberling, president of the Goodyear Tire & Rubber Co.; H. S. Firestone, president of the Firestone Tire & Rubber Co.; W. A. Means, treasurer of the B. F. Goodrich Co., and other officials of Akron rubber companies. When conditions are normal the railroad companies place big orders for rubber hose, belting and other supplies, but during the past year they have ordered only rubber supplies to meet emergency requirements, according to leading officials of the local companies. That the new year will usher in another era of prosperity is the general impression in local rubber circles. All the manufacturers are preparing to meet the demand for Akron products that they feel confident is sure to come.

But Akron rubber men view with some alarm the continued deadlock between England and the United States Department of State over the embargo placed on all crude rubber from the East. While practically all of the Akron companies have a fairly large supply of crude rubber in stock, they are forced to depend almost entirely upon the Brazilian product and this source of supply, it is feared, may prove inadequate if the embargo on the Eastern product continues for an indefinite length of time. In the face of the large volume of business which Akron companies are preparing to handle during the early months of 1915, a short supply would prove a serious handicap.

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On the strength of rumors that the annual reports of The B. F. Goodrich Co. will show earnings of more than \$6,000,000 on common stock, an unusually heavy demand has been created during the past month for shares. Holders of the stock at the present time are at least \$5,000,000 richer than they were a month ago, and indications are that it will go even higher before the next annual meeting. Much attention has been attracted to the increased demand, created originally by Eastern investors, for Goodrich shares, and local brokers predict that they may reach \$30 before the first of February.

Goodyear and Firestone stocks have also been actively traded in during the month by local investors.

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Perhaps the most interesting news of the month in local rubber circles was the report at the annual meeting of stockholders of the Goodyear Tire & Rubber Co. that the common stock had earned 36 per cent. during the year ending October 31, 1914. Despite the war in Europe and the general business depression, the company reported the most prosperous year in its history and the figures in the company's books presented at the meeting bore out this statement. The net earnings for the year were \$3,391,000; the cash on hand \$2,862,000; the unappropriated surplus \$4,052,000, which equals 40 per cent. of the common stock of the company. The stockholders re-elected the directors—F. A. Seiberling, C. W. Seiberling, G. M. Stadelman, F. H. Adams, P. W. Litchfield, H. H. Manton and J. P. Loomis.

Of interest to the rubber trades was the Akron Automobile & Electrical Show, the first of its kind in this city, held from December 12 to 19. Practically all of the local rubber companies exhibited, in addition to a showing of the products of the leading automobile and accessories manufacturers of the United States. The exhibits represented a value of more than \$300,000. Nearly 50,000 people visited the exposition.

A permanent organization to promote a similar show each year has been effected and the substantial support given the promoters this year will enable them to begin 1915 with a surplus. A modest dividend was declared on the first show. The members of the organization are E. T. Jones, Andy Auble, Jr., C. C. Welker, G. W. Funk and W. L. Stouffer.

F. A. Seiberling, president of the Goodyear Tire & Rubber Co., visited Washington late in December and called on President Wilson. He went to the British Embassy, armed with a letter of introduction from the White House, and had a talk with Sir Cecil Spring-Rice, the British Ambassador. Later, he said that he was going to London to lay his protest before the British government.

* * *

Additions under course of construction to the Firestone plant, which will be ready for occupancy early in 1915, will give this company more than 100,000 feet of additional floor space. At least 10 per cent. more men are being employed than in the closing months of 1913, according to President H. S. Firestone. Reports made at the annual meeting a few weeks ago showed sales for the fiscal year in excess of \$20,000,000.

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The Rubbertown Tire Co., of Akron, has been incorporated, with a capitalization of \$10,000. The incorporators include O. J. Schwab, local crude rubber man; J. F. Darcy, a New Yorker, and N. M. Greenberger. It was stated today that those interested are not connected with other rubber interests, and that the company will be an independent concern.

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The "Made in Akron" show, which was to have been staged in this city early in January, has been postponed until later in the year. Many of the largest concerns intending to exhibit were Akron rubber companies, and their officials believed that a better showing could be made if more time was given to preparation.

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An order of the Ohio State Board of Public Works increases the rates to local rubber companies using water from state lakes from 3 to 5 times the rate paid in past years. This increase will cost the companies more than \$25,000 per year.

* * *

The purchase of a site in the business section of the city last month paves the way for the erection of a community garage in which Akron rubber men are interested financially.

Owing to the increase in the number of automobile tire users in Akron many of the big tire concerns, including the Goodrich, Goodyear, Firestone and Miller companies, have established service stations for the convenience and benefit of their patrons.

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Photographs of the interior of the new mansion erected by H. S. Firestone, president of the Firestone Tire & Rubber Co., have been taken for the Tiffany Studio—which directed the work of interior decorating—and will be reproduced in several of the leading magazines of the country.

Mrs. B. G. Work, wife of the president of The B. F. Goodrich Co., has ordered 50 dozen pairs of socks from a Detroit knitting company, to be delivered to the Vacation War Relief Society, which is collecting supplies for the Allied soldiers at the front.

Mr. C. B. Raymond, secretary of the Goodrich company, is in California on a tour of inspection of the company's branches through the West.

Mr. Frank Sell, of the Goodrich office, has been transferred to the company's branch at Omaha. Mr. Sell and his family left last week for the Nebraskan city, where he will begin his work January 1.

THE RUBBER TRADE IN BOSTON.

By Our Regular Correspondent.

SPEAKING broadly, at present writing, four days before Christmas, there is no rubber trade in Boston. Rubber men in all lines except those influenced by the weather are far from enthusiastic regarding business conditions. Business is generally dull in these lines the latter part of December, and this year shows no exception but rather an emphasized condition of inactivity. Automobile tire makers are running their works to reduced output. Mechanicals are in retail rather than wholesale demand. There was a good call for druggists' rubber goods up to last month, since which time trade has fallen off. The manufacture of rubber soles and heels is active, for shoe manufacturers are using many of these in place of high priced leather. The greater part of the month of December, like the previous one, has been too mild and too dry to give any impetus to the clothing and footwear trade, but the long-looked-for snow started the Monday before Christmas, with the effect of immediately stimulating these lines of the rubber trade.

There is considerable talk, hereabouts, of the possibility of capturing orders for several hundred thousand pairs of rubber boots for the armies of the Allies in the field. Just now there are hints that a certain firm of exporters is "nearly ready" to place orders for these boots, and its agents have secured samples and prices from several of the rubber manufacturers. All the manufacturers seem to know about it but under pledge of secrecy refuse to give out any information. That large shipments have already been sent to Great Britain from this port and New York is a well-authenticated fact. That such large orders as mentioned above may be placed is not so assured a fact. But there is no doubt that the soldiers now in the trenches need waterproof and cold-proof footwear, and while there are large manufacturers of rubber boots in England and Russia, there may be a good opportunity for American rubber shoe manufacturers to supply a portion of the demand.

Apropos of this, some of the rubber footwear manufacturers received inquiries whether they can furnish 100,000 pairs of short boots, and on what terms. This has led to the discovery that no company is "long" on short boots, and it is rather doubtful if that number of such boots could be found in the factories or jobbing houses of the entire country. In spite of the comparative mildness of the season, and the fact that the factories made nearly or quite their full quota of advance supplies, the shipments out of the country, and the demands of the regular trade, have reduced the stocks of floor goods to comparatively small proportions.

It is reported that some agents of foreign governments are now in this country trying to buy heavy shoes of leather for army wear; that some of them have been unable to make satisfactory arrangements for such supply, and that they are now investigating rubber-sole leather-upper footwear, similar to hunting boots, as a substitute for the leather shoes.

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The B. F. Goodrich Co., of Akron, has for a long period had a branch selling agency on Boylston street in this city, where its tires were sold. Last month the company established an agency at this location for the sale of its "Hipress" footwear. Mr. F. T. Moore, the regular branch manager, will have general supervision over the agency.

* * *

We had a dog show in Boston the first week in December, and as this was somewhat of a "society" affair, it was attended by "many of the best families." Although the principal exhibits were dogs of many varieties, perhaps the greatest attention was attracted to six pairs of rubber boots. These boots were not of the standard variety, however, but were made to order for "Babykins," "Tiny Tim" and "Toy," three dogs of aristocratic pedigree, and were worn by the canine pets so they

wouldn't get cold feet. This may start a fashion which will help out the rubber footwear industry in dull seasons.

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Mr. Thomas A. Forsyth, of the Boston Belting Co., has been appointed a trustee of the Boston City Hospital, to take the place made vacant by the resignation of Dr. Dowling, who had been its superintendent.

The Hubmark Rubber Co., which succeeded to the rubber shoe business of Laakin & Foster, in this city, and took the store on Congress street which that firm had occupied for many years, has removed to one of the upper floors at 207 Congress street, where it will be located until next spring. At that time it will probably occupy a building on Summer street extension, near the present stores of W. E. Mayo & Co., The Congress Shoe & Rubber Co. and the Regal Shoe Co. This business is under the management of Chester J. Pike, Jr., son of C. J. Pike, for many years prominently connected with the United States Rubber Co.

THE RUBBER TRADE IN CHICAGO.

By Our Regular Correspondent.

GENERAL conditions in the local rubber trade show a great improvement over those of a month ago. Trade holds about the same. The volume of business in tires and all the articles which compose the mechanical rubber line has been satisfactory. The season has been open until the last two weeks, and automobiles remained out much longer than usual. During the past two weeks there has been a great demand for rubber clothing, with dealers anxious for the goods they would hardly look at a few weeks ago.

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Proprietors of rubber clothing stores robbed one after another in rapid succession about a year ago, last week received some light on the operations of the gang that did the looting. Several of the band, who were found guilty and sentenced to prison terms, were brought back to the city to testify in a sensational police graft scandal. One of them states that the gang worked under police protection, and that the officers even assisted them in some of the robberies. They would drive a wagon up to the rear door of the store and make away with all the contents, in many instances leaving nothing but the fixtures. The property would then be sold from wagons in the slums of the city, valuable raincoats, boots and overshoes being passed out at sacrifice figures. When an honest officer interfered the crooks would submit to arrest, to be later set free by higher officials who were getting a part of the profits. The Goodyear Raincoat Co., which has stores at several locations in the loop district, was a frequent victim.

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J. E. Duffield, district manager of the Thermoid Rubber Co., of Trenton, New Jersey, states that the company is closing one of the most successful seasons in its history. Business on all lines has been rushing. On the first of the new year J. H. Liston becomes manager of the Detroit branch which this company has established. Mr. Liston is well known in the local rubber trade, and while his work in the northern city will be of a pioneer nature great things are expected of him. O. C. Hendry, who was formerly of the Texas branch of the Fisk Rubber Co., of Chicopee Falls, Massachusetts, on the same date became northwestern representative of the Thermoid company.

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Henry Spadone, president of the Gutta Percha & Rubber Co., New York, was a prominent visitor to the city during the month. F. McCullough, of the local branch, states that the business of the company for the year just closing has been entirely satisfactory, and has shown a marked expansion in many lines, particularly belting and packing.

The Goodyear Tire & Rubber Co., which moved some time ago to a new location at 1601 South Michigan avenue, has been doing a rushing business for the past month. An advertising feature which deserves mention is a large tire, said to be the largest ever made, which is being displayed in the window. The tire measures 48x8 inches, and is of the pneumatic type.

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There is to be a meeting of the organizations interested in promoting good roads throughout the state some time during the next few weeks, to be held at the Hotel La Salle, in which many prominent State officials are expected to take part. Tire and automobile concerns are much interested in the movement.

The retail trade during the holiday season has been very satisfactory, especially on all rubber novelties. "Kewpie" dolls of red rubber are very popular, and one firm reports a fine business on this item alone.

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Trade paper advertising was given a direct boost in a recent address by John Allen Underwood, the well known advertising expert, at a luncheon of the Executives' Club held at the Hotel Sherman. Mr. Underwood declared that the secret of success in advertising lay in concentration, especially where the appropriation of the advertiser was limited. The retailer, he said, should be the center of advertising, as he is the center of distribution.

THE RUBBER TRADE ON THE PACIFIC COAST

By Our Regular Correspondent.

CONDITIONS in the rubber trade on this coast are satisfactory to the trade, the business for the fall season showing an increase and excellent prospects. The demand for tires is constant and develops with the increase in the number of motor vehicles in use. The extent to which automobiles are used in this section is shown by the fact that in a statement of expenses incurred by a candidate in the recent elections the item for tires alone amounted to \$213. In addition there are many motorcycles, the number of these registered on December 1 being 24,379.

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The Universal Tire Co. expects to have its factory at Anaheim, California, ready for operation early in January, employing about 200 men at the start and equipped to turn out about 100 tires a day. This factory is three stories high, 80x200 feet in area.

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The tire and accessory dealers of Fresno, California, have formed an organization known as the Fresno Automobile Tire & Accessory Dealers' Association. This association was started with 30 members, and will hold monthly meetings.

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H. A. Thompson, who has been succeeded in the management of the Spokane branch of the United States Rubber Co. by E. A. Griffith, has assumed similar duties in connection with the Seattle and Tacoma branches of the same company.

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Ed. S. Campion, for the past six years manager of the factory branch of the Firestone Tire & Rubber Co. at Seattle, and for seven years previous a member of the Firestone sales force, has severed his connection with that company to become sales manager of the Marathon Tire & Rubber Co. of Akron. He has been succeeded by C. W. Brown, former manager of the Firestone San Francisco branch.

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W. H. Bell, for the past three years manager of the Firestone Tire & Rubber Co.'s branch at San Francisco, has gone over to the Kelly Springfield Tire Co. as general Pacific coast sales manager, with F. H. Hearsch as assistant and general repre-

sentative. C. A. Jessup has been appointed manager of the Los Angeles branch of the company.

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C. H. and T. C. Jones, the former of whom has been for the past two years connected with the Seattle branch of the Republic Rubber Co., of Youngstown, Ohio, have established a Republic agency at Tacoma, Washington.

THE RUBBER TRADE IN TRENTON.

By Our Regular Correspondent.

BUSINESS in Trenton, in the rubber and associated industries, shows no decrease in activity; and that general prosperity exists is evidenced by the generous response to the numerous appeals that have lately been made for contributions for the relief of war sufferers and for the various local philanthropies. About \$9,000 has so far been sent from this city for war relief, in addition to supplies of considerable value. More than \$5,000 of this amount was collected for the Belgian Relief Fund, and about \$3,000 for the British Isles Relief Association. The Poor Children's Christmas Fund has had particular interest for the rubber trade, and has been contributed to generously. The workmen of the Thermoid Rubber Co. have given quite freely to this fund, as they have done in previous years, and donations were also made by the Katzenbach & Bullock Co., Inc., dealers in chemicals for the rubber trade. The United & Globe Rubber Manufacturing Cos. made a contribution of \$25 to the Trenton Poor Relief Fund, and Ferdinand W. Roebeling has given \$12,500 to the Ewing Presbyterian Church in Trenton, of which \$500 annually will be at the disposal of the board of trustees.

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The fire department of the city has submitted some comparative figures on the cost of operating motor drawn fire apparatus as compared with that previously used. The report shows a saving of \$57.35 and \$61.26 respectively, in one month's operation of two engines.

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The Three Star Tire Co. has been incorporated here, with a capital stock of \$50,000, to deal in rubber tires and tubes. Edward H. Steel, Archibald F. Updike and Richard G. Whitehead are the incorporators and promoters of the new concern, which is located at 19 South Montgomery street.

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Another tire manufacturing concern has located in Trenton, at Mulberry street and New York avenue. The property at this address, formerly occupied by the American Lamp & Brass Co., has been purchased by the Mecca Tire Co., of Philadelphia, and is being remodeled and improved for tire manufacturing purposes. This property covers about three acres and contains six brick buildings, each 30x90 feet, five of them 2½ stories high and one of 3½ stories. These will be equipped with the necessary modern machinery to turn out from 250 to 300 tires per day, and give employment to about the same number of workmen. George E. Knowles, of Carteret, at one time employed by the Thermoid Rubber Co. and later connected with the Chester Rubber Tire & Tube Co., of Chester, West Virginia, will be general manager of the new concern, whose officers are: Charles Buckley, president; William Fullerton, treasurer; W. J. Cassidy, secretary. The plant will not be ready for operation before March 1.

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The De Lion Tire & Rubber Co., whose plant was mentioned in the June number of THE INDIA RUBBER WORLD as being under construction, will commence operation about January 1, turning out a line of automobile tires and tubes. This company is offering a prize of \$25 for the best slogan offered for use in adver-

tising its products as a trade mark—some distinctive term that will apply particularly to the goods and at the same time suggest that they are of Trenton origin. Suggestions should be sent to the Slogan Contest department of the Chamber of Commerce.

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John E. Thropp, of the John E. Thropp's Sons Co., has been elected director for a three-year term of the Carroll Robbins Civic Association, one of Trenton's prominent organizations.

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The Mattson Rubber Co. of New Jersey was incorporated on November 12, succeeding the Mattson Rubber Co. of New York, whose thirty year charter expired by limitation on that date. The capital stock is \$200,000, the principal office is situated at Lodi, New Jersey, and the officers are: John Behrens, president; H. Lemmermann, vice-president; J. H. Behrens, secretary and treasurer. The Mattson Rubber Co. was started in the 40s by Dr. Morris Mattson. It has for many years specialized in the manufacture of unguaranteed tire casings, also manufacturing a complete line of automobile rubber accessories and raw stocks for all purposes. During the past year the capacity of the plant has been increased by over 50 per cent. through the erection of a modern addition.

* * *

Fire broke out on December 16 in a new shop of the insulated wire factory of the John A. Roebbing's Sons Co. in this city, but little damage resulted, the company's own fire corps extinguishing it with little difficulty.

* * *

The Overman Cushion Tire Co. has been incorporated with a capital stock of \$150,000 to succeed the Overman Tire Co. now in the hands of receivers, and has temporarily located at Belleville, New Jersey, with office and salesroom at 250 West 54th street, New York, the old factory at Passaic having been given up. The new concern will manufacture only the Overman cushion tire, discontinuing the pneumatic type. The officers of the company are: C. A. Taussig, president; J. B. Bleiler, vice-president and sales manager; Mac C. Overman, treasurer and general manager; Alexander Clogher, secretary.

THE RUBBER TRADE IN RHODE ISLAND.

By Our Regular Correspondent.

THE rubber factories throughout the district are at present working fully 85 per cent. of their capacity, according to the latest reports, and there appears to be a promising outlook for a continuance of this condition or better throughout the winter. Although some anxiety was entertained at the announcement of the recent embargo on crude material, the local factories have so far escaped its effects. Most of the Rhode Island plants were fortunate in having fairly large stocks of goods and material on hand.

The early snows in northern New England, New York State and across the Lake Regions have caused a rush of work for the local factories manufacturing rubber shoes and boots, and it is predicted that there will be a good trade throughout the Winter. All of the manufacturers unite in saying that the outlook has greatly brightened since the first of the month and that the orders which are now coming in will keep the plants running close to full time until spring. Already some of the factories are behind on their deliveries from two to four weeks.

One of the most important, as well as most interesting, rumors in connection with the local rubber trade is the announcement made a few days before the Christmas holidays that Providence is to have the largest plant in the world for the production of solid motor tires. This does not mean the opening of a new plant, but will be one of the effects of another step in the policy of concentration and specialization to be taken by the United States Tire Co. beginning with the new year. At that time the manufacture of automobile tires will be discontinued

at the plant of the Revere Rubber Co., which is the local branch of the United States Tire Co., and instead the making of solid tires for motor trucks, carriages and vehicles of all sorts will be concentrated at this plant, each of the three other plants of the United States Tire Co. now making solid tires as a part of their general line abandoning this line to the Providence plant.

* * *

Waste heat boilers have been installed recently in the open hearth department of the Washburn Wire Co. at Phillipsdale. The installation consists of two large vertical boilers which will utilize the heat now passing to the stacks. The waste gases from the open hearth furnaces will be drawn through the tubes by large fans placed at the top of the boilers and then will pass on to the stacks. It is estimated that 350 horsepower will be generated by each boiler at maximum capacity. This installation is in line with recent endeavors of manufacturers all over the country to utilize waste heat. It is expected that the first of these boilers will be put in operation at an early date, and that later, if they prove satisfactory, a similar installation will be made at the reheating furnaces.

* * *

A new dancing shoe made by the National India Rubber Co. at Bristol has been the subject of numerous experiments, especially in the construction of the heel. The new heel, which is to be molded, will have the appearance of a solid mass of rubber, but the center is actually hollow, thus reducing the weight.

The factory is planning to increase its tennis shoe department. The daily output of tennis shoes at present is 30,000 pairs. The Auburn Foundry Co. is making new machines to be used in the manufacture of tennis shoes, and part of the new equipment has already been received at the plant. Necessary improvements are being pushed as rapidly as possible, and it is expected that the changes will be completed in the near future.

Andrew W. Anthony, associated with the National company, has been appointed by Governor-elect R. Livingston Beeckman as a member of his personal staff with the rank of Lieutenant Colonel. Mr. Anthony is a son of the late S. Reed Anthony, of Boston, and married Miss Primrose Colt, daughter of Senator LeBaron B. Colt and niece of Col. Samuel P. Colt, president of the United States Rubber Co.

The National employees subscribed nearly \$100 for the poor children of the town of Bristol, to be distributed for Christmas cheer.

* * *

Indications at the Alice Mill of the Woonsocket Rubber Co., of Woonsocket, point to an active winter. For the first time in many years the management omitted the annual shutdown of a fortnight or more during the holiday season, during which time an inventory of stock is usually taken. Instead the plant will only close for three or four days around New Year's to take stock. In view of the fact that the plant employs about 1,500 hands, the announcement that work there is unusually plentiful has been received with general satisfaction by not only those employed at the factory but by those having business relations with them. Some of the orders that have caused the exceptional rush at the Woonsocket plant have resulted from the European war. But the snowstorm already referred to was more directly responsible for the activity, as it helped to deplete the rubber stocks all over the country.

* * *

Edward R. Young, who conducts a rubber business at 35 Westminster street, Providence, filed a voluntary petition in bankruptcy on November 30 in the United States District Court and was adjudged to be bankrupt. The amount of the liabilities were given at \$2,191.29 and the assets at \$5,018.51. The Revere Rubber Co., and the Boston Woven Hose & Rubber Co. are the largest individual creditors.

Transatlantic Notes.

By Our Correspondent

EMBARGO UPON EXPORTS

SINCE the war broke out rubber has been receiving increasing attention at the hands of the British government, and the embargo which was applied in the second week of November by the total prohibition of exports of the commodity from the United Kingdom. The irony of the situation lies in the fact that, whereas a few months ago the authorities were so lax about the rubber trade that the growers and dealers conceived it their duty to induce the government to declare the produce conditional contraband, the industry is now suffering from a surfeit of departmental attention. The noose has been gradually drawn tighter, and now there is grave danger that unless the restrictions are shortly relaxed the rubber plantation industry will be strangled.

The various stages by which the present *impasse* has been reached were, first of all, the order that shipment from the Orient was to be confined to the Allied ports and neutral countries in Europe. Then came the declaration that rubber was to be included in the list of conditional contraband, an order that was later converted into one of absolute contraband. The next step was the resolution that plantation rubber must be shipped only to British ports, and finally came the staggering announcement that export of the commodity from this country must entirely cease. Rightly or wrongly, the trade feels that it has scarcely received fair treatment at the hands of the government, although it is recognized that at this juncture the public weal must be the paramount consideration. It is true, however, that, while the government has in all other cases affecting trade and finance conferred with the leading men in the banking and commercial world before taking action, in the case of rubber the export embargo was resolved upon suddenly and apparently without any reference to the industry concerned. The need for exhaustive consideration of the subject before taking drastic action was the more desirable in this case because of the very complex nature of the crude rubber industry. It is rightly contended that, outside rubber circles, knowledge of the trade is of a very nebulous character, hence the general feeling that importers and others should have been consulted before a measure so uncompromising and charged with such grave consequences should have been set in motion.

It is unnecessary to go into details as to the causes which have led up to the embargo, for these are doubtless fully appreciated on both sides of the Atlantic. The evidence was pretty conclusive that Germany and Austria were obtaining supplies of rubber through neutral countries. The exports of rubber from Great Britain to certain neutral countries were enormously in excess of their normal requirements. The explanation was obvious, and the government took what they deemed to be the only safe action in the circumstances. No resentment is felt at the intention to stop the trade, but only in regard to the method employed. It is thought that alternative measures might have been adopted which would have been fully as effective while inflicting less hardship upon all concerned.

As matters stand all interests will suffer by the embargo. The outlet for the producing industry will be seriously blocked, while consumers in neutral countries will be hampered by lack of raw material. In a very short space of time these factors will become acute, and the question will naturally be asked whether the interests of the many are to be sacrificed for those of the few, especially when the latter are engaged in a trade which, if not precisely illegitimate, is of a nature that may well lead to international ruptures. Viewed impartially, it is scarcely conceivable, on common sense grounds, that the legitimate consumers of plantation rubber in neutral countries will not bring

pressure to bear in the right quarters for the removal of the *embargo d'être* of the embargo. Indeed, the majority of neutrals have already done their part by prohibiting the re-export of crude rubber, and in some cases of manufactured rubber goods. But failing the necessary assurance from other quarters that the supply of raw rubber to Germany will cease, there is not the slightest doubt that the British government will not relax the present embargo one iota.

Owing to the various government restrictions issued recently, the Board of Trade returns relating to crude rubber shipments during November are of peculiar interest. In respect of both imports and exports, the latter especially, a heavy falling off is shown in comparison with the figures for the previous month. Taking imports first, it will be seen that Brazilian shipments to Great Britain fell off by more than 50 per cent. during November. On the other hand, supplies from the eastern plantation zone show a fairly big increase. In the circumstances this was only to be expected, because export to other than British ports has been prohibited. Altogether the imports have not suffered a very serious reduction and it is a moot point whether the deficiency has not been counterbalanced by direct shipment from some of the ports of origin to the consuming centers.

IMPORTS INTO THE UNITED KINGDOM.

From	1914.	
	November.	October.
French West Africa	pounds 69,400	9,100
Peru	97,600	105,700
Brazil	1,047,600	2,357,200
Gold Coast	6,400	17,800
Straits Settlements	4,565,800	3,226,200
Federated Malay States	1,700,700	2,048,400
Ceylon	2,298,800	1,675,400
Other Countries	1,459,600	2,251,300
	11,245,900	11,691,100

EXPORTS FROM THE UNITED KINGDOM.

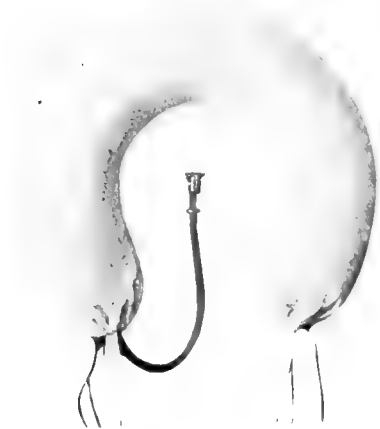
To	1914.	
	November.	October.
Russia	pounds 1,066,500	4,703,500
Germany		
France	497,200	254,700
United States	6,599,500	8,674,100
Other countries	649,700	409,400
	8,812,900	14,041,700

The export figures are naturally more striking, but when it is considered that the embargo upon shipment from the United Kingdom came into force on November 10, it is remarkable that the falling off was not greater. Particularly is this the case in respect of shipment to the United States. Presumably the whole of the 6,599,500 pounds exported were despatched to America during the first ten days of the month. This is at the rate of about 19,798,500 pounds for the whole of November comparing with 8,674,100 pounds in the previous month.

No doubt the extraordinary shipments to the United States during the early part of the month influenced the government in their decision entirely to prohibit export. So far, the statistical position of crude rubber in this country has not been materially affected by the embargo, because stocks were already abnormally low whilst reduced imports have partially counterbalanced the decrease in exports.

RUBBER LIFE-SAVING COLLARS

The rubber life-saving collars recently mentioned as having been adopted by the British Admiralty for ships' crews, have quickly proved their efficacy. It is recorded in reference to the sinking of the gunboat "Niger" by a German submarine off the Kent coast that "all the boats except the whaler were smashed, but the men who were wearing new life-saving collars of india rubber promptly inflated them, and found the device of great service in keeping them afloat until they were picked up. Many lives were undoubtedly saved by these collars." By the way, the personnel of the Australian navy has now been fitted out with this handy and invaluable device.



It seems that the project to provide rubber boots for the British troops in the trenches in Flanders has been wet-blanketed by the War Office. The Rubber Growers' Association, which first broached the idea, determined not to be suppressed, is now making a presentation of a number of the boots for use in the trenches.

RUBBER SEIZED IN ANTWERP.

There is reason to believe that Germany did after all seize a considerable stock of rubber on taking possession of Antwerp. The quantity is estimated by some as being in excess of 1,000 tons, and it is even said that a big price was paid for it. The Antwerp market deals to a limited extent in plantation rubber, but it is chiefly identified with the Congo trade. Such rubber as was found there doubtless consisted mainly of African sorts. The market will be the better for its disappearance.

PLANTATIONS IN GERMAN COLONIES.

There is a fair number of British-owned plantation companies operating in German territory in Africa, and their position since the outbreak of war has given rise to some curiosity and uneasiness. Communication between this country and the estates has been entirely cut off for several months. Whether these plantations have been commandeered and are being administered for the benefit of the Fatherland is not known, but if there be any truth in the statement that Germany is most embarrassingly short of raw rubber supplies, the temptation to do so must be very great. Hitherto the plantations in this part of the world have always suffered from a dearth of labor, and it is not probable that the war has brought any relief in this respect. Very little *Hevea* is grown in this region, Ceara being the tree principally cultivated. One or two of the properties have been fairly substantial producers. At the meeting of one of these companies, held recently, it was stated that with rubber selling in the neighborhood of 50 cents, it was impossible to operate at a profit, and unless important economies could be effected it would be necessary to close down. To this end it has been proposed that three plantations in the district, namely, Lewa, Kamna and the German East African Co., should amalgamate, but no further steps in this direction will be possible until the termination of the war.

INCREASING PRODUCTION.

It is noteworthy that in spite of the disorganization of trade and industry throughout the world, there has been no very perceptible decline in the production of rubber. Even the prohibition of the export of rubber from the United Kingdom has not had any sensible influence upon the activity of the produc-

ing estates in the Orient. The crop returns for the month of November which have so far come to hand indicate with scarcely an exception, production on a scale larger than ever. When the war broke out in October, 1914, the crop in this country was exceptionally low, and as prices here have not given way to any material extent, there certainly appears no immediate necessity to curtail production. As bearing indirectly upon this subject it may be mentioned that modifications have already been made in the original order that all rubber produced in Ceylon, Southern India and British Malaya was to be shipped only to the United Kingdom. Permission was recently given to the Dunlop Co. to ship a certain quantity of raw rubber from its own plantations for the use of its factories in Japan, and it was further stated that direct shipment from plantation centres to Alaby-stock would be permitted.

A TAPPING RECORD.

Some interesting facts are to hand concerning the 37-year-old *Hevea* tree in the Botanic Gardens, near Colombo, Ceylon. The tree has been tapped, with short intervals, over a period of four years and nine months, and the records show that the yield during that period totaled 392½ pounds of dry rubber. The two sections of the tree on which operations were conducted were only partially tapped, and it is said that had they been completely tapped, over 550 pounds of rubber would have been secured. The yield actually obtained averages 82.6 pounds per annum, which compares well with the 4 pounds per tree commonly expected from the average plantation specimen, planted at upwards of 100 trees to the acre. It cannot be said that the tree under notice has grown under specially favorable conditions, for it stands within 5 feet of a hard road composed of laterite. The authorities have decided that tapping shall be discontinued. It is just as well for the industry that all rubber trees are not such prolific yielders of latex.

BRITISH DEMANDS FOR WAR SUPPLIES.

Orders for 12,000 cycle tires are said to have been placed with the Moseley Co., by the British War Office, while parts for 35 motorcycles have also been ordered, the destination of which has not been announced. A new military pattern of bicycle is being made for the British War Office by the New Hudson Cycle Co., of Birmingham, which is executing an order for 1,200 cycles, and is said to be sharing in the order for 3,000 placed by the Russian government.

RUBBER SHAREHOLDERS' ASSOCIATION.

The above-named association was founded in London in September, 1913, for the protection of the interests named. It did not meet with the financial support of the trade, however, and at a recent meeting the committee unanimously recommended the winding up of the association.

BRITISH TECHNICAL INFORMATION BUREAU.

The British Secretary of State for the Colonies has authorized the formation of a "Technical Information Bureau," for the purpose of dealing with inquiries from manufacturers, merchants and others in the United Kingdom and colonies, with reference to raw materials and industrial processes. A staff of experts will be in communication with producers in the colonies and users of raw materials in England.

BIG INQUIRIES FOR WATERPROOF CAPES AND GROUND SHEETS.

An inquiry has been going the round of Manchester manufacturers for 160,000 capes, each requiring 3½ yards of 60-inch proofed cloth. The entire order will require 4,200 pieces of stout twills. For ground sheets a further inquiry is anticipated at an early date, said to be the largest ever issued for the article. Ducks 36 inches wide, rainproofed, have been booked in large quantities.

Proofers are doing their best but cannot turn out half the quantity wanted.

The India Rubber Trade in Great Britain.

By Our Regular Correspondent.

TRADE CONDITIONS

IN a general way there is but little alteration to record. Matters are much the same as they were two months ago, proofers, tire makers and surgical goods makers being still busy, while other departments, ministering to sports and pastimes, the general engineering and building trades, etc., are correspondingly slack. An important event, especially from the American point of view, is the embargo placed by the British government upon the export of plantation rubber to countries other than those of the Allies, the object being to prevent tires getting into Germany. The matter will no doubt be dealt with by the editor, and I shall not, therefore, enlarge upon it except by the remark that it has caused an important fall in the price of the commodity, to the advantage of our manufacturers, although nothing has been settled at the time of writing.

I imagine that before these lines are printed an amicable arrangement will have been come to with America whereby the latter's government will guarantee that no trade is done with Germany in raw or manufactured rubber, and that this will pave the way to the removal of the embargo. In the meanwhile the British manufacturers are getting cheaper rubber, and the wild rubber districts, which have been severely hit by the large output of plantation rubber, are, temporarily, at any rate, in for a better time.

A prediction which has happily been falsified in the event was a period of national distress owing to the effect of the war on industries. As it turns out, poor relief and unemployment is less than it was two years ago, and in some localities distress committees instead of looking after the unemployed are acting as labor recruiting agencies. This results from the drain of labor by recruiting coupled with the vast army contracts, which have made towns like Sheffield, Leeds, Northampton and Dundee so busy. The cotton trade has not benefited to any great extent, and the £700,000 worth of government work that has come to Manchester relates to various industries of which rubber is one of the most important.

A legal case of considerable importance, which has been decided in the high court, referred to the payment of money due to the London branch of the Continental Tyre & Rubber Co., Limited, the judge holding that money owing to the firm by British buyers of tires must be paid and not withheld under any plea of trading with the enemy. Leave was given to appeal, so this decision may possibly be upset; but if not it will not be acted upon in many other cases as, although quite a number of German and Austrian rubber works have agencies and branches in England, they have not the status of British limited companies.

The stoppage of payment from the enemy countries, and also from Belgium, has been a matter of concern to rubber works doing principally a continental business, though the cases are very few in which it has led to serious embarrassment. One such is that of the Lancashire Rubber Works, Limited, rubber heel manufacturers, of Manchester, whose creditors have been called together to discuss a deficiency of £2000. The rubber heel people generally have not had at all a good time, especially as they have not shared in the prosperity arising from government contracts. Talking of contracts leads one on to say that the usual grumbles as to government contracts yielding little or no profit are heard almost to the same extent in these days of apparent prosperity as is the case in normal times. Owing to close competition prices have to be cut somewhat close, and in the interval between tendering and the placing of contracts by

the authorities markets for this or that material may go against the contractor, who does not always care to cover himself in advance for orders which may not materialize. In the rush to obtain goods, accentuated by the appearance of France and other countries in the market, the ordinary procedure of obtaining tenders and awarding contracts has been somewhat varied, and all sorts of people who have got the required goods to sell at competitive prices have attained the position of government contractors. As the greatest care and discrimination is exercised by the government officials, there is no reason to suppose that the country's interests have suffered, despite the rumors which have been ventilated in parliament.

RUBBER CHEMICALS AND THE WAR.

Manufacturers of rubber chemicals report considerable activity in the demand from the home trade, but the most striking feature in the business has been the demand from Japan and various neutral countries which have hitherto presumably bought from Germany and France. Barytes has been specially in demand, though not entirely in connection with the rubber trade. With regard to sulphate and carbonate of barytes I may mention that the world's production is, roughly, 170,000 tons, to which America contributes about 50,000, the United Kingdom 45,000, Germany 25,000, Belgium 31,000 and France 14,000 tons. It will be seen, therefore, that the two leading producers are in a position eventually, if not immediately, to make up any deficit, especially as there is plenty of material, the output of which has been closely regulated by the demand and, I may add, the somewhat unsatisfactory prices, which make the mining a rather unremunerative business.

Golden sulphide of antimony is of course a manufactured article made by comparatively few firms. As the German export is stopped to a large extent, and the French makers are seriously crippled, it is not surprising that the few English makers have found their productive capacity seriously taxed to fill orders for home and abroad. The sulphur situation has been relieved by shipments both from Sicily and America, though the immediate future of the Sicilian imports seems somewhat clouded owing to the recent stoppage of exports to Germany via Switzerland. I understand that an undertaking has to be given that the sulphur is not to be used for munitions of war. I have not seen any of the American sulphur, but am told that it is decidedly inferior to the Sicilian from the rubber man's point of view, and that the advantage in price is very small.

GOLOSHES.

Severe weather, with falls of snow, has been experienced unusually early this winter both in England and on the continent. Naturally this has given a fillip to the golosh trade, the main feature of which, as far as Britain is concerned, is the steady encroachment of the home made article on what a few years ago were the preserves of the Americans. "Bostons," as the latter are termed by the dealers, are still the only sort to be obtained at some shops; elsewhere they stock both British and American makes, while in yet other establishments British goloshes only are obtainable, and if you talk about American sorts you are looked upon as somewhat out of date. The ordinary retail price for men's goloshes is 3/11 [95 cents] and 5/6 [\$1.35], according to quality, the prices varying a few pence according to the status of the retailer's establishment. The average man does not inquire as to the make of the goloshes he is purchasing, or turn up the sole to see whether the stamp is Boston Rubber Shoe Co. or any other American make, North British or "Liver."

The largest makers in Great Britain are the North British Rubber Co. and the New Liverpool Rubber Co., Limited, which makes the "Liver" golosh. The storm slipper is more commonly bought by ladies than by men, while the reverse is the case with the snow boot, which is more commonly worn than it used to be. With regard to nomenclature, while the descriptive term rubbers is hardly ever met with, there is a tendency among retailers to use the likewise descriptive term overshoe instead of the older established one golosh.

STORAGE OF SOLVENTS.

The ordinary position in British rubber works is for the local authority to grant a license for the storage of a certain quantity, which must not be exceeded. Since the war, however, surveillance has been kept by the military authorities, under the powers of the Defense of the Realm act. Under these circumstances action was recently taken against the Pluviusin Co., Limited, of Mouton, near Manchester, for storing solvent in excess of their license, and a fine of £2.20 [\$10.22] and costs was imposed, despite the plea that the company had been busy in government work, and had experienced a difficulty in getting supplies.

The Crude Rubber Washing Co., one of the various flotations of the rubber boom, appears to be slowly making its way towards prosperity in its new home at Wembley. A proposal is shortly to be brought forward to change the name of the concern to the Alperston Rubber Co., Limited. This seems a sensible move now that the business is largely concerned with the manufacture of rubber goods, and the name would be less likely to invoke painful memories in the minds of those who omitted to sell out at the high water mark.

Portugal, which has now entered into the war as one of the Allies, has no pretension to rank as a rubber manufacturing country, as it has only one rubber works, established near Lisbon somewhere about fifteen years ago.

Lieutenant-Colonel Fallows, of the Leyland & Birmingham Rubber Co., Limited, who holds a command in the East Lancashire Territorial Brigade, is now with the brigade in Egypt, where the horizon at the moment is much more clouded than was the case a month or two ago.

Mr. R. G. Stewart, I regret to report, died last November. The greater part of his life was spent in the service of the North British Rubber Co., at Edinburgh and London, and in 1900 he succeeded the late Mr. Bartlett—of detachable pneumatic tire fame—as general superintendent of the Castle Mills. It is now a good many years since I met the deceased, whose kindly disposition endeared him to a wide circle of friends.

The death has also been recorded of Mr. John Sykes, for many years chairman of the Card Clothing Manufacturers' Association. Though his Lindley Mills at Huddersfield were devoted to the production of rubber faced cards for textile mills, he was also a cotton spinner on a large scale, and a man of considerable wealth.

Rubber pavement is on trial in the city of London on a section of the Old Kent Road, where traffic is heavy, the average being ninety tons per square foot per hour for twenty-four hours. Another section is to be laid down in Cannon street, in the very heart of the city. The Rubber Growers' Association gave 1,000 tons of plantation rubber for the experiment, and has offered an additional 1,000 tons at the nominal price of 25 cents a pound.

The pavement is made by laying jarrah wood blocks with a surface cushion of rubber held by dovetailing. The blocks are easily removable; they interlock perfectly and with water-tight joints. The vibration is so much less than with any other form of pavement that a much less substantial foundation is needed.

The section in the Old Kent Road after 295 days of use shows no signs of wear, whereas an adjacent four-inch wood block pavement lost one-half an inch in thickness in the same time under the same load.

E. BUNGE & CO.

The London "Times" chronicles the sudden descent of German



EDWARD BUNGE.

officers upon the office of E. Bunge & Co., Antwerp, the claim being that Belgian treasury funds had been deposited in their keeping. Mr. Edward Bunge will be remembered as the president of the Rubber Planters' Association of Belgium and as one who has been exceedingly active financially in the development of both wild and plantation rubber. Many of the plantation companies in the Federated Malay States were financed by the Bunge Association.

CLAIM TO BE ENGLISH.

R. Woolfe & Co., Limited, rubber manufacturers and waste merchants, of London, England, announce that they are a distinctly British firm, having no business or national connection with Austrians or Germans. Their entire staff is English and their ancestors began business in England more than 200 years ago.

RUBBER TIRES FOR STREET CARS.

The introduction of tires made of rubber or other silent material for street cars, was suggested by a speaker at a recent meeting of the Tramways' Association of Great Britain. He contended that a properly designed tire for street cars would exceed in durability tires now in use on motor buses and motor wagons, on which a life of 20,000 miles was common. Moreover, the wear and tear on the rails, and the cost of maintenance, would be greatly reduced.

The fact that rubber tires would eliminate noise and vibration, while a speed of 20 miles an hour could be attained, was advanced as an argument in their favor.

The Rubber Planters' Association, of London, not long ago diverted many tons of plantation rubber to street pavements, hospital floors, etc. This was to produce new uses and thus avoid a glut in the market and consequent low prices. It was enterprising but of doubtful expediency. That same rubber on the market today would be a boon to some one.

According to reports coming via Germany, there is a shortage of raw rubber in Norway, Sweden and Denmark. It appears that large quantities destined for nordish manufacturers have been detained by England. It is said that one large rubber works in Norway already has been compelled to close its doors.

NORWAY.

Motor delivery wagons are gaining in popularity in Norway and it is expected will ultimately replace horse-drawn vehicles in that country, particularly in the lighter models. A report from United States Consul General Hendrick, of Christiania, states that in that city there are 150 motor delivery vehicles, including 14 motor trucks.

RUBBER GOODS IN SPAIN.

According to the report of the Austrian Consul at Barcelona, the Spanish market affords a good outlet for rubber products, rubber shoe imports having in 1911 represented \$85,000, while toys and stationers' sundries amounted to \$80,000. The principal part of the goods mentioned have come from Germany and Austria-Hungary.

SWISS TRADE IN RUBBER HEELS.

When first introduced in Switzerland some years ago, the demand for rubber heels was small. Few dealers carried them, but those that did realized fair prices. This trade has now been taken up by all leather and rubber goods dealers, so that competition has eliminated much of the profit. The most popular style and quality is selling at 8d. (16 cents) retail.

THE FRENCH IMPORT DUTY.

A letter received from the Rubber Growers' Association, London, in regard to the French import duty on indirect rubber shipments, states that direct shipments of rubber to France are now permissible, provided the bills of lading are made out to a distinct consignee in France—the exemption applying to products of extra-European origin originally destined for France or Algeria and disembarked at British ports in consequence of the war, but not to such products in general regardless of their original destination.

MADAGASCAR SUBSTITUTING MOTOR CARS FOR RAILROADS.

The French authorities in Madagascar are said to have decided to give up the operation of the local railways, on account of the comparatively small number of persons using them, and to transport passengers exclusively by automobile. For some years the railways have been run at a great loss by the government, but since the trial operation of automobiles the cost per passenger mile has been greatly reduced. It is hoped to make the enterprise self supporting by the end of the year 1914.

GERMAN NOTES.

GERMAN and Austrian rubber manufacturers have been unable to procure their usual supply of "M. R. X." since the breaking out of hostilities. Proposals, however, have recently been made by an agent in one of the neutral countries bordering on Germany for a large supply of "M. R. X." for which there can be only one ultimate destination. The matter is yet under negotiation.

Berlin has had an interesting exhibition under the name "What the German Soldier Needs in the Field." The purpose of the enterprise has been to show to the public in general and to encourage the sale of articles which might be of use to the soldiers in the field. The German rubber industry was well represented and a great variety of rubber goods was sold at the exhibition, including waterproof coats and caps, rubber bottles, waterproof sheets, rubber socks, gutta percha sheet, etc. There has been a large demand for rubber boots, mainly those with high tops, and for pneumatic cushions.

The board of the United Harburg & Vienna Factories, at its last meeting, decided to propose to the general meeting contemplated for November a dividend of 6 per cent. The net profit amounts to \$190,894, against \$145,179 for the previous year. To this there should be added the profits carried over of \$85,231. After writing off large sums for depreciation and reserves, the carrying forward of a further increased amount is contemplated. Since the outbreak of the war the departments working for army requirements have been well occupied. On the other hand, the difficulties of export trade have caused a reduced outturn in the departments.

Manufacturers of rubber coats and rubber clothing have sent

out a circular informing their customers of a large advance in the prices of rubber coats, vests, etc. The advance has been made necessary by the high price of raw material in Germany and by the demand for rubber for the manufacture of tires and other war material.

The war has had a beneficial influence on the turnover of those retail shops specializing in rubber goods. While in ordinary times a good deal of trade has been taken away from these establishments by outfitters, shoe stores, etc., interest concentrates now in specialties, and the dealers find that they can sell not only bandages and surgical rubber goods, but also such articles as rubber coats, rubber shoes, etc.

According to advices coming from Vienna, the price of raw rubber has increased to about four times the value before the war. This, of course, has caused a considerable advance in practically all classes of rubber goods.

The report that the Dunlop Rubber Co. of Germany contributed \$5,250 to a British war relief fund is denied by the company. On the contrary, they contributed to the various Red Cross stations in Germany \$1,250 in cash. They also gave \$1,250 worth of rubber goods for hospitals, 10,000 "helmet sponges" and an infirmary with 80 beds. They are paying their men who are in the army 50 per cent. of their wages and they have also donated two automobiles to the German Red Cross.

The Continental Caoutchouc & Gutta Percha Co. has turned one of its huge buildings into a thoroughly equipped hospital. The chief executive is Dr. Gerlach, who is well known to many manufacturers in the United States. The Continental company states that in consequence of the advance in cost of raw material, which amounts since the beginning of the war to from 60 to 75 per cent., it has been obliged to advance the price of its pneumatic tires. The new price list (No. 124) dates from August 24.

Herr Heinrich Pfeiffer, for many years business manager of the Eduard Frankenburg Rubber Factory, Hanover, has undertaken since October 1 the direction of the rubberized fabric department at the Hanover-Linden Rubber Manufacturing Co.

The Cable Works at Fröndenberg, Ruhr, have been registered for the manufacture of all descriptions of insulated wire, with a capital equaling \$16,500. Herr August Köhle is business manager.

The directors of Maschinenbauanstalt Humboldt, makers of rubber machinery, Köln-Kalk, propose a dividend of 6 per cent. The trading profit was 6,144,049 marks [\$1,462,284]. A special contribution to the reserve fund of 200,000 marks [\$47,600] is proposed, and the same amount is set aside for the benefit of persons depending upon officials and workmen who have been called upon for active service. 1,385,083 marks [\$329,650] are carried to new account. The dividend declared for the year 1912-13 was 8 per cent., from a trading profit of 5,793,573 marks [\$1,377,870].

Austria-Hungary has prohibited the export of insulated wire to Belgium, France, Great Britain, Japan, Russia and Servia.

The German auxiliary cruiser *Cap Trafalgar*, which was sunk on September 14, had about 14,000 square yards of rubber flooring, which had been laid by the Gummiwerke, Fulda. This material had proved efficacious in service and had been adopted by many other steamers.

Rubber news from Germany is difficult to get and often delayed. What crude rubber there is is held at a premium of about one hundred per cent. Its use for individuals, as for motor tires, has been prohibited. Factories such as the Continental, Dunlop, Harburg-Wein and Metzler, are running, but on government orders only. The great Zeppelins, for example, take much rubber. A visitor reports seeing cloth for fifty of these craft being coated in one of their factories.

Every particle of rubber scrap in the country is being collected and turned into reclaimed rubber. It is said (not verified) that

new mats, hose, toys, and goods not absolutely necessary have also been scrapped and reclaimed. The same source also affirms that stores of hard rubber goods ready for export were condemned and ground to dust and remanufactured into electrical parts, for military use.

In this connection the late German prohibition of the export of hard rubber goods in any form takes on an added interest.

The following are included in the list of articles forbidden export by Germany: Caoutchouc, guttapercha, balata; waste rubber; oil caoutchouc for proofing; surgical instruments, with exception of obstetrical and dental; rubber for rubber hose, bandages, etc.; cable for military and general purposes; goods out of soft caoutchouc, with the exception of guttapercha paper and certain products of guttapercha for asbestos goods. Special permits must be obtained if it is desired to export any of these articles, and no permits will be granted on hose, tubes, tire covers and tires.

Among rubber goods to which attention has been given in Germany for the war are drinking bottles, tobacco boxes and other articles to help the German soldiers withstand the hardships of war. Recent additions to the military kit include "gutta percha paper" for the treatment of sore feet. This article is displayed in the druggists' windows, accompanied by a show card calling attention to its merits, and stating that its application does not involve disuse of the feet. It is wrapped around the feet before putting on the socks, so that the sore places are fully covered, thus relieving the friction caused by the socks in marching.

In addition to the regular articles needed by soldiers, there are a number of specialties which have been taken up in Germany, such as sleeping bags, ear protectors, and head, ear and nose bandages. Caps, including the "Mensur" style, which have been in the hands of bandage makers and druggists, are also now receiving the attention of the rubber trade.

The "Vogufa" Rubber Goods Factory, of Pausa, Vogtland, Saxony, has patented a substitute for rubber shoes in the form of a protector made of strong rubberized fabric, to be worn in the shoe over the stocking. Small openings on the upper part prevent the stoppage of perspiration. Even when the shoes are broken it protects the foot from moisture and cold.

A GERMAN VIEW OF SHOE MANUFACTURE.

A GERMAN manufacturer writes as follows in the columns of the "Gummi-Zeitung" on the subject of vulcanizing rubber shoes:

Of all factory made rubber articles, rubber shoes claim the greatest attention. Not only is the utmost care required in the selection of the raw materials and in the compounds, but it is particularly the vulcanization which can lead either to the production of a first class article or of the reverse.

In spite of the use of tried compounds and suitable grades of crude and reclaimed rubber, the following defects may be produced in the finished shoes by defective vulcanization: 1, Porosity of the soles; 2, blistering of the uppers; 3, sub-vulcanization and the consequent exudation of sulphur; 4, super-vulcanization or so-called "scorching"; 5, metallic appearance of the varnish.

Porosity almost exclusively arises from moisture in the raw materials. Therefore, crude and reclaimed rubber must be first dried by heat. Whiting (or like substances) can be dried in a special stove, being then carefully protected against moisture during storage. Tars, pitches or oils are first superheated in order to remove all volatile components. It is considered advisable before use to obtain laboratory tests of the separate materials for moisture. That even with such precautions porous soles may be turned out, may arise from using crude rubber with too high a resin content or which is decomposed.

The blistering of the uppers is usually due to the presence of

moisture in the fabrics used. It is consequently recommended to first boil these fabrics thoroughly in vats, and to dry them carefully.

Under-vulcanization and the consequent exudation of sulphur, provided the compound has been rightly prepared, arises merely from a mistake in curing. Shoes with this defect are not bad merchandise, though the flaw renders them unsalable to the fine trade. Super-vulcanization or "scorching" causes the shoes to be unmerchantable, and may be caused by a defect in the plant, or by carelessness of the operator. Super-vulcanized shoes tear at the edges, break in the uppers and crack in the varnish.

Metallic brilliancy in the varnish of the upper is caused by the heating pipe not being tight, by which means moisture is allowed to penetrate during the vulcanization; or by the atmospheric air being too damp at the time of admission. The vulcanizing chamber ought, therefore, to be heated before use.

The following method of vulcanizing shoes, the result of many years' experiments, has been found to produce articles of good and regular quality. A horizontal vulcanizer is used, of about 8 feet in diameter and 32 feet in length; the heating coils, each acting separately, being built in as usual. At the back end of the vulcanizer in the lid, as well as in the side walls, are spaces for the recording thermometers.

In the interior of the vulcanizer at the highest and lowest points pipes are inserted, reaching from the back wall. These are provided with small openings (1/25 to 1/6 inch) toward the inside of it. Between these two pipes are placed at a higher level two other pipes; the suction and pressure pipes of the rotary mechanism driven by a small motor. The hot air is thus continually drawn from above and forced back into the oven, where it is distributed through the perforated pipe. Uniformity in the suction or pressure of the air must be tested before the apparatus is placed in operation. Sheets of metal are hung between the pipes and the shoes in order to prevent too direct a radiation of heat and to distribute the pressure of the air. The fans of the rotary mechanism should revolve at the rate of 260 to 300 revolutions per minute, and the drive must be sufficiently forcible to absorb and introduce the air with rapidity at a pressure of 22 to 29 pounds per square inch.

At the beginning of the vulcanization the air first introduced, which is charged with the fumes of varnishes, etc., is allowed to escape into the open; fresh air previously heated and dried being admitted. During the process of vulcanization the rotary mechanism is allowed to revolve several times in a reverse direction to ensure the absorption of the air and its re-introduction from above. By hanging maximum thermometers at various points of the vulcanizer the highest temperature arrived at can be recorded for future reference.

This system of vulcanization is said to give a thoroughly uniform product, and to prevent claims in regard to defects in manufacture, which were formerly unavoidable.

PLANTATION FIRES.

A fertile source of danger on plantations arises from the neglect of planters to extirpate the "lalang," which is found between their trees. The government of Cochin China has addressed a circular to the colonial administrators of the country, comprising the above view and adding that there is absolutely no risk of fire on the plantations visited, where they are carefully kept. This danger, however, exists where the planter fails to destroy the grasses and merely lets them dry where they lie. In such a case the least spark will produce a conflagration.

In conclusion it is impressed on the colonial agents that it is advisable to call the attention of planters to this source of possible danger.

A book for rubber planters—Mr. Pearson's "What I Saw in the Tropics."

THE JINRIKISHA AND ITS TIRES IN CHINA.

From Our Japanese Correspondent.

THREE kinds of jinrikishas are used in Manchuria—iron, rubber and pneumatic tired, at prices from \$30 to \$50. The pneumatic tire is intended for use with the Chinese type of jinrikisha, which is rather smaller than the other two. An estimate places the total number in various parts of Manchuria at—Chanchin, 650; Futien, 3,000; Reijon, 127.

Rubber tires are imported into Manchuria either through Chinese merchants in Futien, who gather them from other districts, or through Japanese dealers at Chanchin, who buy from the manufacturers in Japan. About 70 per cent. of the total are solid rubber tires and 10 per cent. rubber pneumatic tires. The solid rubber tires used on these jinrikishas cost \$8.50, and the pneumatics \$12.50. At Futien rubber tired jinrikishas are selling at from \$36 to \$45 in the cheaper grades, up to \$56.25. Solid tires are imported from Tokio and Osaka.

The carriages, wheels, tires and other parts of jinrikishas are imported principally from Osaka, and assembled by the Japanese merchants at Futien, who sell the vehicles to Chinese dealers in completed form. The latter distribute them to private consumers on the instalment plan.

Dealing with other parts of China, there are in Chefoo 450 jinrikishas, those using solid rubber tires costing from \$18 to \$23 for common to \$36 for superior grades. Wheels in conjunction with solid rubber tires cost \$9 a pair. Foreigners have shown a preference for jinrikishas with solid rubber tires, but the Chinese have continued to use the cheaper iron-tired vehicle. It is anticipated, however, that improved roads will develop the use of rubber tires.

Shanghai has two kinds of jinrikishas, the Foboche with a rubber pneumatic tire—of which there are about 10,000—and the Yajiche, numbering some 2,000, with iron tires. In addition there are about 2,500 Foboche for private use. The 12,500 Foboche used in Shanghai are fitted to the extent of 80 per cent. with pneumatic rubber tires, of which 30 per cent. come from the Dunlop Rubber Co. (Far East), Limited, of Kobe, whose manufactures are guaranteed for 6 months.

In addition to the Dunlop company, the Michelin company does an excellent business in tires, the Foboche having been originally a French article, and most of the persons hiring out jinrikishas being Frenchmen. The French goods, while not guaranteed and slightly dearer, are said to be rather better than the Dunlop make. Besides the Dunlop and Michelin companies, the Continental Rubber Co., a German concern, supplies 20 per cent. of the demand under a six months' guarantee.

The jinrikishas in Shanghai require about two pairs of tires each in a year, or for the 12,500 Foboche in use, 25,000 pairs annually, with a value of \$200,000 on the basis of \$8 a pair.

In Hong Kong there are 2,200 jinrikishas, the majority of which have solid rubber tires, imported from the Dunlop Rubber Co., London, and other British and German firms.

Pneumatic rubber tires are not used in Hong Kong, the unevenness of the roads being responsible for the demand for a strong, solid tire. The Hong Kong jinrikisha makers import the parts from Great Britain, Germany and Japan, and ship their products to other parts of China. The largest maker in Hong Kong is Koche Konau, with a capital of \$25,000 and 800 vehicles for hire.

TAPPING ON ALTERNATE DAYS.

With a view to prevent over-production, the Malacca Planters' Association recently agreed to the plan of tapping on alternate days. A meeting of the body named favored a general reduction of production by 30 per cent.

Replete with information for rubber manufacturers.—Mr. Pearson's "Crude Rubber and Compounding Ingredients."

DECOMPOSITION OF RUBBER THROUGH MICROBES.

IN dealing with the above subject, N. L. Söhngen and J. G. Fol lately considered the following questions:

Are the mechanical properties of the portions colored by the action of microbes different from those of the uncolored rubber? Is there consequently any reason for a lower valuation of colored rubber? Is the hydro-carbon in rubber subject to the attacks of microbes?

In the second part of the article the authors speak of the micro-organisms in rubber and their influence upon its mechanical qualities. They first give a review of the subject and record their experiments regarding micro-organisms and the mechanical properties of spotted rubber. They deduce the opinion that the microbes forming the spots beyond the discoloration exercise no injurious effects on the rubber. Thus a lower valuation of spotted rubber cannot be defended. According to their opinion it is, however, advisable to prevent the growth of the micro-organisms, which can be accomplished by a suitable arrangement of the drying chambers. It is only at a certain degree of moisture that microbes are developed in rubber.

The third part of their article treats in detail of the microbes which attack rubber, the following results being obtained by the authors:

1. On air-dried rubber (containing 0.5 per cent. of water) micro-organisms cannot be developed in consequence of the lack of water.

2. When water is present in abundance, commercial rubber is a medium for the development of many kinds of bacteria and germs, to the detriment of the albumens, sugars and resins which are present. Some kinds produce red, black or brown spots without noticeably changing the mechanical properties of the rubber.

3. Two kinds of *actinomyces* often found in garden soil and sewer water, *actinomyces elastica* and *actinomyces fuscus*, are in a position to attack and assimilate the hydro-carbon in rubber.

4. From these microbes an enzyme attacking rubber and soluble in water is not obtained by separation.

5. The knowledge of the facts—first that the development of microbes can take place in moist rubber, when the rubber hydro-carbon is not decomposed, and the mechanical properties do not change, but where pigments are often given off, which diminish the market value of the rubber; and secondly—that there are kinds of *actinomyces* which can positively attack the hydro-carbon of rubber, and thus lower the viscosity, makes it desirable to again urge that it is of the greatest practical interest to prevent as far as possible the development of micro-organisms in rubber. The growth of microbes is prevented by the rubber being dried on the plantation as quickly and carefully as possible, in suitably arranged drying chambers.

[G. S. Whitby (see V. 25, P. 596 to 621 of 8th International Congress of Chemistry, New York, 1912) concluded that tackiness in rubber was caused by an enzyme, but V. Rossem (Caoutchouc et Gutta Percha, February '13, P. 6981, and Chem. Abs., '13, P. 1811) attacks these views.]

LATEX DENSITY EXPERIMENT.

A number of experiments were made during the last year to test the specific gravity of latex, from which a suitable latex hydrometer has been constructed. This machine is made by J. J. Griffin & Sons, London, and is intended for factory controls. Experiments were carried out to test the comparative value of formic and acetic acids for *Hevea* coagulation. It has been suggested that if the rubber prepared with formic acid proves equal to that produced with acetic acid the former should be substituted for the latter, being cheaper and more economical. It would be still cheaper but for the high freight charged on it by the steamship companies as being dangerous cargo.

Some Rubber Planting Notes.

THE USE OF WATER IN TAPPING.

DR. A. J. ULTEE, director of the Besoekisch Testing Station at Djember, Java, having stated that the use of water in tapping tends to reduce the volume of production, Dr. F. T. Beederode disputes this theory in a recent number of the "Indische Mercur." He believes that with the use of water, latex flows longer than otherwise and thus increases the volume of production. He does not unconditionally reject dry tapping, but believes the use of water to be a distinct advantage. This, he contends, is particularly so where there are laborers enough so that no laborer has to care for more than 250 trees. Where the supply of labor is insufficient and each tapper is required to look after 500 to 600 trees, dry tapping, being more quickly done, he admits is preferable.

RUBBER IN SUMATRA.

According to the Imperial Institute of London there is a considerable difference in the rainfall at various points in Sumatra, but it is everywhere sufficient. Owing to the good soil rubber trees can grow at altitudes up to 1,000 feet, but are usually situated between 4 feet and 120 feet. The Assam rubber tree, *Ficus elastica*, is grown in the provinces of Benkulen, Tapanuli and Achin.

The acreage under *Hevea* increased from 400 acres in 1902 to 197,530 acres by the end of 1912, in addition to which there were plantations of *Ficus elastica*. The nominal capital in Sumatra rubber plantations at the end of 1912 was estimated at \$53,000,000, of which one-half was British. Many coffee plantations have been transformed into plantations of *Hevea*.

A NEW RUBBER COAGULANT IN CEYLON.

Toddy Vinegar, the new coagulant, has already been mentioned in these columns.

The process of manufacture consists of the waste coconut water being allowed to ferment for four or five days, when it can be immediately used for coagulation. One or two ounces of fermented liquid will coagulate a pint of pure latex, producing a finer rubber than is obtained by the present system of using crude acetic acid. Experiments are now being made as to how long the liquid will keep, and as to whether it will stand transportation to the rubber estates.

RUBBER KEEPS BETTER THAN TEA.

With reference to the storage of rubber the "Times of Ceylon" states that at the opening of the war a good deal of rubber, tea and other products was stored in local warehouses, in view of the disturbance of business. Rubber will not deteriorate from storage, while tea after a couple of months in stock becomes a more or less unmarketable product.

CEYLON CONDITIONS—1913-1914.

Heavy investments were made some years ago by Ceylon planters, and the commercial community generally, in young rubber trees, and large returns were required from the revenue bearing estates to develop the immature plantations. The drop in rubber prices in 1913 on the London market caused real distress, and for a time threatened ruin to a number of rubber companies, and even to various commercial houses. The crisis was, however, safely passed and the market recovered somewhat toward the beginning of 1914. Among the principal difficulties planters had to contend with were the heavy rains which impeded cultivation, and the increased difficulty in getting sufficient labor from South India.

RAILWAY EXTENSION IN THE FEDERATED MALAY STATES.

The new railway line from Bukit Mertajam, a junction near the town of Penang, to Alor Star, the capital of Kedah, has been opened for traffic. It forms part of the Federated Malay States government railway system; which is thus brought closer to the Siamese frontier. The ultimate connection of the new line with the Royal Siamese Railway is in contemplation. It is anticipated that the opening up and development of Kedah will be facilitated by the improved communication thus established.

WHAT MALAYA MIGHT HAVE DONE.

In taking the chair at the inaugural lecture of the City of London College rubber course recently, Mr. John McLuan, chairman of the Rubber Growers' Association, said that there were areas of *Hevea* 10 or 11 years old, producing 750 pounds per acre. If all the planting had been uniformly successful, the 700,000 acres in Malaya would in a few years give about 234,375 tons, leaving the rest of the world out of the calculation.

In conclusion he remarked that at no very distant date such an article as rubber is bound to be produced on a scale unprofitable to a large proportion of the companies engaged in the industry. He hoped, however, that lowness of price will lead to many new applications at present not dreamt of.

EXPERIMENTS IN THE MALAY TESTING STATION.

In a communication from the Federated Malay States Information Agency, Mr. Lewton-Brain, who is in charge, describes the vulcanizing and testing station established at Kuala Lumpur, which is said to be one of the most complete in existence. He states that many experiments have been tried with a view to solving the problem of plantation rubber.

What the manufacturers complain of is not that plantation rubber is not good, but that it is not uniform; that each lot must be treated differently. In solving this problem many experiments and tests have been made on working, vulcanization, etc.

The problem of variability in plantation rubber is an extremely complicated one, and it will be years before the full value of this work can be realized. Work has at least been started on the fundamental problem. Generally speaking the large plantations are taking more care to keep methods and products uniform. Still many extractors use haphazard methods. Experiments were carried out on smoking, drying, dilution of latex, coagulation, fungus spots, tackiness, etc.

RUBBER ACREAGES IN BRITISH MALAYA.

Official statistics of the planted surface in British Malaya are as follows:

	January 1, 1913.	January 1, 1914.
Federated Malay States.....acres.	399,197	433,324
Straits Settlements	94,263	111,316
Johore	91,827	117,022
Kelantan and Kedah.....	34,837	45,373
Trengganu	1,497	1,510
Total	621,621	708,545

MORE LIGHT IN PLANTATIONS.

Large rubber plantations in Malaya have experienced trouble in the renewal of the bark, due to the trees being too close together. The time is foreseen when such plantations will be obliged to cease tapping the older trees, the bark renewed being too thin to allow of tapping with profit. Planters remove the useless branches and then cut down the trees which prevent the development of their neighbors. This movement of giving more light is said to be getting more general.

ENGLISH VIEWS OF PROSPECTIVE RUBBER PRODUCTION.

Mr. A. Lampard, the well-known authority on rubber, has expressed the opinion that the plantation production of 1914 will amount to 70,000 tons, and that from the present acreage under plantation rubber there will be a gradual increase up to 180,000 tons.

The wisdom of England having an independent supply of rubber has been amply demonstrated by the present war. Owing to the good quality of plantation rubber and the economy of its production, he believes that the practical elimination of wild rubber will soon become an accomplished fact.

Dealing with the probable future of plantation rubber, Mr. John McEwan, chairman of the Rubber Growers' Association, thinks that the threatened check to production is likely to be only temporary. He declares that he is pessimistic as to the future of rubber, but only so far as it relates to large yields and low prices. He looks for low prices as the inevitable result of the coming large production, but the existence of these factors holds out promise of large development of trade. He adds that with plans thoroughly organized, producers have little to fear from low prices, as the high yields per acre at low costs per pound will give excellent returns on reasonable capitalizations.

WAR CONDITIONS IN STRAITS SETTLEMENTS.

In an official report Consul General Caspar L. Dreier, at Singapore, has summarized the measures taken by the Straits government to meet the conditions arising from the war. Arrangements were made for making advances on rubber to planters, in order to facilitate the working of the estates without a material reduction of labor.

War risk on general cargo shipments was taken by the government at 5 per cent., but in view of the insurance companies reducing the rate to 2 or 3 per cent. the official rate was only made use of to a slight extent.

The banks, which at first had been stringent in their action, soon relaxed this policy, with the result that produce began to move again. No local moratorium had been declared.

Statistics of the total exports for 1913 from the Straits Settlements and the Federated Malay States show: Gutta percha, \$2,968,186; Para rubber, \$46,847,474. The proportions sent to the United States were \$66,991 and \$4,366,443. The exports from the Federated Malay States alone for 1913 are given as, respectively, \$26,114 and \$32,524,024.

Commenting upon local conditions, the report shows total imports of about \$135,000,000, including cotton blankets and piece goods to the extent of about \$18,000,000. The importance of this market both as a source of supplies and an outlet for manufactures is thus illustrated.

THE FUTURE OF RUBBER PRODUCTION IN FRENCH OCCIDENTAL AFRICA.

The rubber crisis in Brazil has opened the eyes of French colonial officials to certain dangers which may result to French Occidental Africa by an undue preponderance of rubber production in the economic resources of the colony. Official inquiries which have been extended to the British rubber plantations in the East, and French plantations in Indo China, have given the impression that those plantations, in consequence of their better working methods and cheaper and more efficient labor, will be able to undersell the African product. This would threaten the destruction of the rubber production of those regions and endanger the economic life of the whole colony. It seems, therefore, necessary that rubber production in French Occidental Africa be raised to the same level as in the Federated Malay States and Indo China. As this, however, would be very difficult, it seems likely that rubber production in the colony may be discouraged in future, in favor of more promising products.

WEST AFRICAN RUBBERS.

The latest bulletin of the Imperial Institute, London, contains a group of interesting reports on various rubber samples of West African origin. These include Para rubber from the Gold Coast and Sierra Leone, and Funtumia rubber from the former source.

PARA RUBBER FROM GOLD COAST.

On the Gold Coast the government agricultural stations (notably those of Aburi and Tarquah) have very successfully undertaken the cultivation of *Hevea Brasiliensis*, besides which European cultivators have established a number of plantations, some of which have now reached the productive stage. In many parts of the country the natives are devoting attention to the tree, and tapping at the above named stations has been successful.

In tapping blocks of trees at Aburi average yields were obtained for 158 tapplings of 2 pounds 10½ ounces, and for 156 tapplings of 2 pounds 13 ounces. At Tarquah experimental trees eight years old gave an average yield of 3 pounds 12 ounces of dry rubber when tapped on alternate days.

A sample of smoked Para biscuit from trees thirteen years old at Aburi, received in January, 1914, and valued in July of the same year at 2s. 1d. (50.68 cents) per pound, gave the following results: Loss in washing (moisture and impurities), 0.8 per cent.

Composition of dry washed rubber:

Caoutchouc	per cent. 94.1
Resin	2.9
Protein	2.7
Ash	0.3

PARA RUBBER FROM SIERRA LEONE.

Two samples of Para rubber produced experimentally in Sierra Leone—one of them from trees five to six years old—coagulated with lime juice and dried in smoke, showed 94 per cent. of dry, washed rubber. In composition it compared favorably with eastern plantation Para, being, however, somewhat deficient in elasticity and tenacity. This feature is attributed to the method of coagulation, and the use of acetic acid is suggested.

The second sample, from trees four to five years old, coagulated by evaporation, air-dried and smoked, yielded 92.6 per cent. of caoutchouc, and showed in physical properties superiority to No. 1. With this grade it is likewise recommended to use acetic acid in place of coagulating by evaporation, which increases the amounts of resin and protein in the rubber.

FUNTUMIA RUBBER FROM THE GOLD COAST.

In January, 1914, a sample of *Funtumia* was received at the Imperial Institute from the Gold Coast, prepared by the addition of 1 per cent. of formalin to the crude latex and by drying in a smoking chamber. The rubber was clean, and its physical properties good. Analysis showed 81.7 per cent. of caoutchouc, 10.1 per cent. of resin and 7.5 per cent. of protein. In July, 1914, this quality was valued in London at from 1s. 10d. (44.60 cents) to 1s. 11d. (46.62 cents) per pound.

RUBBER IN PAPUA

According to a recent statement of Mr. A. S. Blomfield, of Melbourne, who lately visited Papua to look after his rubber interests, the total area controlled by his various companies is about 30,000 acres, of which 1,500 acres are under rubber. The first rubber trees were planted six years ago, the stumps coming from Ceylon, from which source, as well as from Singapore, seeds were subsequently obtained. Planting was on a scale of 22 x 16½ feet, or 112 trees to the acre. While the rainfall was fairly light (about 65 inches), the growth of the trees was good. Tapping commenced at the age of 3½ years, when the circumference exceeded 18 inches at 3 feet from the ground.

In 1913 7,000 trees were tapped, which produced 10,000 pounds of rubber, the best of which realized 2s. 3½d. (55.75 cents) in London.

RUBBER IMPORTS AND EXPORTS AT SANTOS.

The Santos district of Brazil imported in 1913 rubber goods to the value of \$405,000 from the following countries: Great Britain, \$78,000; Italy, \$40,000; Germany, tires \$35,000, rubber goods (unspecified) \$60,000; France, tires \$192,000.

The rubber exports for the first six months of the present year from that port only amounted to \$3,119, as compared with \$22,612 for the same period a year ago.

THE NEW DUTCH BANK FOR SOUTH AMERICA.

Much interest has been shown in the Dutch Bank for South America, which was established before the outbreak of the war, with a capital equaling \$1,608,000. It contemplates operating chiefly with Argentina, attempting to secure a share of the \$20,000,000 worth of trade now passing between Holland and that country. Aside from the banking institutions in the Dutch Indies, it is said to be the first of that character with Dutch capital, intended to facilitate oversea trading.

PARA COMMERCIAL ASSOCIATION.

On November 9 the Para Commercial Association celebrated the fiftieth anniversary of its foundation, in its new quarters at 33 and 34 Boulevard da Republica. After opening the proceedings, Senhor Manuel José Rebello, Jr., president of the Association, invited Major Pedro Nolasco Monteiro, representing the governor of the state, to take the chair, likewise asking the collaboration of Senhor Dr. Antonio Martin Pinheiro, mayor of Para, and other officials, including Senhor José Amando Mendes, first secretary of the association, who read the original minutes of November 9, 1864. Letters of regret were then heard from Dr. Eneas Martins, governor of the state, and from M. Ed. Payan, French consul at Para.

Dr. Eladio Lima, the official orator of the association, then delivered an eloquent address, giving an historical review of its career, in the course of which he referred to the establishment of the Practical School of Commerce. Another feature of the program was the presentation of prizes to the students of the above school whose terms had concluded in the years 1908 to 1914.

PREPONDERANCE OF HEVEA IN BRAZILIAN SHIPMENTS.

According to the report of Consul Robert Fraser, Jr., of Bahia, the exports of Brazilian rubber for 1912, the last year for which official statistics are available, were: *Hevea*, 38,151 tons; *Mangabeira*, 388 tons; *Maniçoba*, 3,724 tons; total, 42,263 tons. Bahia's proportion was 2,025 tons, comprising *Mangabeira*, 96 tons, and *Maniçoba*, 1,929 tons.

It is estimated that Bahia shipments for 1913 were only 579 tons, practically all *Maniçoba*, sold at about 40 cents per pound. During the last year Bahia rubber has largely gone to France, whereas a large proportion was formerly sold in the United States. *Mangabeira*, on account of its lack of elasticity, is used principally for rubber matting and like purposes.

For the first time in history, a shipment of beans raised in the Acre territory has arrived in Manaus. This means that the Acre rubber gatherers are not only raising their own produce, but are getting into a position to export it.

The Department of State after communicating with Ambassador Morgan at Rio de Janeiro, informs THE INDIA RUBBER WORLD that the Brazilian Government desires and intends to continue during 1915 all the American preferentials.

Mr. D. C. W. Aymors, manager of the General Rubber Co., Para, Brazil, has recently been in New York, enjoying a well-earned vacation, part of which was spent in Europe. He sailed for Para on the "Justin," December 30.

RUBBER IN BOLIVIA.

According to a French report the Bolivian production of rubber in 1912 consisted of—*finca*, 1,355 tons; *caucho*, 689 tons; *sernamby*, 166 tons, forming a total of 2,210 tons, against 1,644 tons in 1911. Four varieties of trees furnished the latex: *Morada*, found in low and marshy soils; *Blanca*, found on the plains; *Amarilla* and *Itambe*.

The average yield is 8 pounds per tree, but virgin trees give a larger quantity. Because of the bad methods used by the natives a long rest is necessary between the tapping periods.

The *estradas* (or lots handled by one tapper) usually contain 100 to 120 trees, often at considerable distances from each other. The tappers receive no fixed salary, but get the equivalent of 40 cents per pound for fine rubber collected, and about 24 cents per pound for *caucho*. These conditions might be acceptable were it not that the tappers are obliged (as in Brazil) to purchase their provisions and supplies from their employers at outrageously high prices. Bound down by this perpetual debt, they are the victims of an iniquitous system which is one cause of the decadence of wild rubber.

The tapping season lasts from May to the middle of August, and from October 1 to January 1. Rubber is usually shipped in bales of 30 to 100 pounds. Fine grades are often shipped in bulk, *sernamby* being sometimes cased and *caucho* being in bales of 100 to 150 pounds. Rubber is occasionally placed in skins, which are sold on arrival at destination.

PERUVIAN STATISTICS.

According to a detailed statistical summary in a recent issue of "Peru Today" the foreign commerce of that republic in 1913 represented: Imports, \$30,443,884; exports, \$45,668,890. Exports thus exceeded imports by about 50 per cent. During the last 10 years imports have increased by 40 per cent. In the exports, copper, cotton, sugar, petroleum, silver, rubber and wool held the leading places in the order quoted, rubber standing sixth, with 6,130,163 pounds, valued at \$3,971,054. The figures show a reduction in 1912 of 12½ per cent. in weight and 40 per cent. in value.

PERUVIAN RUBBER EXPORTS DURING YEARS 1904 TO 1913.

	Pounds.	Value.
1904	4,896,571	\$3,261,421
1905	5,598,780	4,447,913
1906	5,678,352	4,599,565
1907	6,677,091	4,645,670
1908	5,547,521	2,962,862
1909	6,177,083	5,536,512
1910	5,843,632	6,222,666
1911	4,758,503	2,979,244
1912	7,039,266	6,715,896
1913	6,130,165	3,971,055

The government has endeavored to meet the difficulties arising in the *montaña* region through the heavy fall in rubber by a tax of 8 per cent. on the exports of the article through the port of Iquitos. This tax will be paid on the cost of production, on a basis established by an official board. A reduction is contemplated in the duties on rubber exported from the Madre de Dios territory, or through the port of Mollendo, in proportion to the prices of the London market.

CHANGE IN PERUVIAN EXPORT DUTIES.

With a view to meeting the conditions due to the fall in rubber, the Peruvian government has placed the tax on rubber from Iquitos at 8 per cent. on the cost of production, to be fixed by a joint official board. It is likewise proposed to lower the duties on rubber exported from the Madre de Dios river district, or through the port of Mollendo, making same proportionate to the prices quoted in London.

Should be on every rubber man's desk—Crude Rubber and Compounding Ingredients; Rubber Country of the Amazon; Rubber Trade Directory of the World.

RUBBER AND BALATA NOTES FROM DUTCH GUIANA.

By Our Regular Correspondent.

THE European trouble is having a most disastrous effect on both rubber and balata undertakings. It is believed, however, by the rubber growers in the colony that the war is a blessing in disguise and that prices will be increased in the course of time. However true this may be, the present outlook for both industries is decidedly black.

Mention was made some time ago that a French combination with headquarters in Paris had formed a company to exploit certain wild rubber tracts, and that a capital of five million francs [\$965,000] was to have been invested in this undertaking. It is most regrettable to have to record the fact that soon after the war broke out the promoters cabled to the colony saying they were compelled to withdraw their engagements owing to the unsettled state of the financial market. As the matter now stands the owners of these wild rubber tracts have to look about them for new investors. The United States is the only country at the present time that can produce capital, and it would be wise for the proprietors of these concessions to open negotiations with capitalists in that country. I have been informed that the lands are favorably situated and in close proximity to the capital of the colony. A railroad runs through the heart of the properties, and daily communication can be reckoned on. Transportation is cheap and rapid. There is about 74,310 hectares of land (a hectare equals 2½ acres) on which wild rubber trees grow, and an average of 14 trees per hectare has been found on examination.

The plantations that grow Para rubber, cocoa and coffee have suffered considerably since the war broke out, especially those whose products are shipped to Europe. The prices of cocoa and coffee have been extremely low, and local consumption is limited to a very few kilos per month, the bulk of produce having to be stored up against a rise in price and neutral bottoms to export the product.

It seems most unfortunate for Dutch Guiana just at this time, when the colonial crops are so plentiful and the weather conditions so favorable, that no adequate market can be found. The government statistics show that 660,578 kilograms [1,453,272 pounds] of balata was produced from January to October, 1914; 1,078,757 kilograms [2,373,265 pounds] during the same period in 1913.

There is at the time of writing more than 200,000 kilograms [448,000 pounds] of balata in the bush awaiting transportation to town, but it is said the concessionaires prefer leaving it there rather than to incur the expense of bringing it in. As I have mentioned before in previous correspondence, balata can be bought right in Paramaribo for only a few American cents per pound. There are no purchases, however, for there is no ready money. The article will deteriorate by the end of two years. If balata is kept too long and confined to a closed room, it generally becomes shrunken and loses weight.

It is interesting to mention that the majority of merchants and others in the Colony are eager to become better acquainted with American business methods. In fact, the majority of the people in Paramaribo favor United States enterprise in preference to any other, and hope that trade relations—on an extensive scale—will spring into being between the two countries.

The Government's rubber enterprise—Plantation Sloopwijk—will, in the near future, be a large producer of rubber. Many thousands of florins have been expended annually on this estate and the Government feels so certain of success that a further large amount has been voted for expenses in 1915. No less than fl. 90,859.33 [\$36,343.73] is to be expended. Here are some of the chief items in the estimate:

Immigration expenses	fl. 17,621.20	(\$7,048.48)
Labor	fl. 41,650.00	(\$16,660.00)
Plant material	fl. 300.00	(\$120.00)
Building	fl. 3,000.00	(\$1,200.00)
Salaries, management, overseers, etc....	fl. 11,640.00	(\$4,656.00)
Sick nurses, etc.	fl. 4,250.00	(\$1,700.00)
Tools and implements.....	fl. 4,000.00	(\$1,600.00)
	fl. 82,461.20	(\$32,984.48)

Sloopwijk comprises 284 hectares under cultivation. The principal products are *Hevea Brasiliensis*, coffee, cocoa and bananas. The reports from this undertaking constitute a feature of interest, as showing the progress made in various cultivations. The rapid and healthy growth of the rubber trees and the satisfactory tapping returns all go to prove that in the near future—should the price of rubber increase—this undertaking ought to bring in to the Government handsome returns on the capital invested.

FRENCH COLONIAL COTTON.

According to the bulletin of the French Colonial Cotton Association the following was the cotton production of the French colonies for the years 1912 and 1913, under the auspices of the association:

	1912.	1913.
Senegal	pounds. 44,000	16,990
Upper Senegal and Niger.....	220,000	217,252
Dahomey	275,000	385,990
Ivory Coast .....	.....	87,421
New Caledonia	363,000	567,666
Tahiti	33,000	34,804
Algeria	396,000	264,000
Madagascar	7,700	.....
Total	1,338,700	1,574,123

Above figures do not include the returns from Indo-China, which colony is not under control of the association.

FINANCING THE EGYPTIAN COTTON CROP.

The Egyptian cotton crop has been estimated as 800,000,000 pounds, being above an average yield. About 100,000,000 pounds of last year's crop was carried over. These conditions are naturally felt in Egypt, cotton forming that country's only source of wealth. Egyptian banks have been accustomed to import yearly from \$50,000,000 to \$75,000,000 in gold to move the crop, but after the outbreak of the war gold imports practically ceased. It was then decided that the National Bank of Egypt should make advances to the planter, holding the cotton as security and issuing notes against it of the same value as gold. This plan would enable the cultivators to hold their cotton for eventual realization when the international market becomes more settled.

INDIAN COTTON CROP OUTLOOK.

The 1914 Indian cotton acreage has been estimated at 14,710,000 acres as compared with 14,833,000 acres in 1913-14 and 12,095,000 acres in 1912-13. The crop is thus considered as likely to equal the banner one of 1913-14.

Samples received in France from Morocco indicate the value of that country as a base of cotton supplies. Continuous drought has affected results in Algeria. Good progress has been made in Dahomey, but the opening up of the northern part of the colony by railway must precede any important development in that quarter.

Should be on every rubber man's desk—Crude Rubber and Compounding Ingredients; Rubber Country of the Amazon; Rubber Trade Directory of the World.

Recent Patents Relating to Rubber.

UNITED STATES OF AMERICA.

ISSUED NOVEMBER 3, 1914.

- N**O. 1,115,514. Pneumatic tire. F. S. Dickinson, New York, N. Y.
 1,115,548. Rubber tired wheels. W. J. Kent, New York, N. Y., assignor to Revere Rubber Co., Chelsea, Mass.
 1,115,566. Wheel tire. A. A. Picard, New York, N. Y.
 1,115,667. Vehicle wheel. F. A. Guth, Waverly, Ohio.
 1,115,702. Inhaling device. W. Luxmore, Chicago, Ill.
 1,115,734. Resilient balata ball. L. T. Petersen, Youngstown, Ohio.
 1,115,875. Tennis shoe. N. F. Towsley, Watertown, and C. H. Roper, Belmont, assignors to Hood Rubber Co., Watertown—all in Massachusetts.
 1,115,908. Internal bath apparatus. M. A. Dees, St. Louis, Mo.
 1,115,920. Vehicle wheel. L. S. Flatau, St. Louis, Mo.
 1,116,009. Composite sole and soling material. G. E. Butterfield, West Newton, Mass.
 1,116,014. Hot water bottle. M. B. Clarke, Akron, Ohio.
 1,116,018. Rampboot hat covering. P. Collagan, East Newark, N. J.
 1,116,101. Skiving machine. E. Nall and W. C. Tyler, assignors to The Goodyear Tire & Rubber Co.—all of Akron, Ohio.
 1,116,120. Wheel tire for road vehicles. R. Reid, Glasgow, Scotland.
 1,116,141. Buoy comprising an envelope made of rubber cloth. L. W. Skoldberg, New York, N. Y.
 1,116,256. Automobile wheel tire. L. S. Flatau, St. Louis, Mo.

Trade Marks

- 57,698. R. D. Bogue, Cincinnati, Ohio. An arrow with the word *Arrows* over it. For chewing gum.
 67,458. Franklin Caro Co., Richmond, Va. The words *Coca-Cola*. For chewing gum.
 67,698. The Savage Tire Co., San Diego, Cal. A tire with an Indian's head in the center over the word *Savage*.
 77,252. Revere Rubber Co., Providence, R. I., and Chelsea, Mass. A diamond design enclosing the word *Nu-Eut*. For arch supports for boots and shoes.
 79,911. New York Belting & Packing Co., New York, N. Y. The word *Pohano*. For sheet rubber machinery packing.
 79,507. Block Brothers Clothing Co., St. Joseph, Mo. The words *Rain Arrows*. For waterproof coats.
 79,716. Maryland Rubber Co., Baltimore, Md. Miniature sketch of Atlas supporting the earth, and the name *Atlas*. For bathing caps and gloves.
 79,717. Maryland Rubber Co., Baltimore, Md. Sketch of Atlas supporting the earth, and the name *Atlas*. For air beds, cushions and pillows.
 79,814. C. B. Kirkpatrick, Newark, N. J. The word *Fulite*. For rubber repairing compounds and adhesive cements.
 80,285. Wm. Wingley Jr. Co., Chicago, Ill. An illustration of a double-headed spear. For chewing gum.
 80,286. Wm. Wingley Jr. Co., Chicago, Ill. The word *Doublemint*. For chewing gum.
 80,547. Plymouth Rubber Co., Canton, Mass. The words *Kempe*. For fabricated soles for boots and shoes.
 80,689. Thermoid Rubber Co., Trenton, N. J. The word *Fordoid*. For rubber casings, inner tubes, liners, etc.
 81,553. W. B. Price, Poughkeepsie, N. Y. The word *Perpetite*. For a waterproofing compound in paste or liquid form for use on fabrics, etc.

ISSUED NOVEMBER 10, 1914.

- 1,116,393. Foldable life preserver. M. Despot, Dayton, Ohio.
 1,116,462. Storm rubber. J. L. Moran, Corning, Cal.
 1,116,464. Dual tire rim construction. E. H. Myers, assignor to The Firestone Tire & Rubber Co., both of Akron, Ohio.
 1,116,550. Car. G. C. Piddle and L. R. Buys, both of Akron, Ohio.
 1,116,683. Hot water bottle. A. C. Fegers, New York, N. Y., assignor to The Goodyear's India Rubber Glove Manufacturing Co., New York, Conn.
 1,116,795. Slitting machine. J. A. Cameron and C. B. Birch, assignors to Cameron Machine Co., all of New York, N. Y.
 1,116,866. Tire wipage machine. J. W. H. Dew, London, England.
 1,116,825. Syringe. C. E. Kells, New Orleans, La.
 1,116,835. Device for raising sunken vessels, which includes a pair of inflatable ballast members. J. S. Norman, Great Falls, Mont.
 1,116,868. Saliva ejector with flexible elastic tube. A. A. Anzelewitz, New York, N. Y.
 1,116,913. Portable sink. T. R. Peregoy, assignor to D. C. Ammidon and H. J. Varran, all of Baltimore, Md.
 1,116,932. Jacket for hot water bottles. J. J. Schwartz and L. R. Strauss—both of New York, N. Y.
 1,116,939. Spine tire. J. J. Shipley, Tampa, Fla.
 1,116,954. Machine for cutting strips from web material. C. H. Thordarson, Chicago, Ill.
 1,117,007. Adjustable hand stamp. W. Dowling, New Haven, Conn.

Trade Marks.

- 70,907. Lee Tire & Rubber Co., Conshohocken, Pa. The word *Zig Zag*. For rubber tires.
 71,188. American Rubber Co., Boston, Mass. An illustration of a bird under the word *Eagle* in a triangle. For rubber boots and shoes.

- 79,06. J. C. Simon and L. Eckert, both of Pittsburgh, Pa. An ornamental design in a square with the initials *S & E*. For footwear made of rubber, etc.
 80,193. R. E. Beckett, Boston, Mass. The words *Safety-First*. For boots, shoes, heels and soles made of rubber.
 80,776. Padgon Thomas Iron Co., Memphis, Tenn. The words *Improved Royal Rubber Roofing*. For rubber roofing.
 81,41. W. B. Price, Poughkeepsie, N. Y. The word *Resist*. For waterproofing composition for fabrics.
 81,533. K. S. Shickluna, Buffalo, N. Y. An illustration of an aeroplane above the words *Over-All*. For tire repairing fluid, rim cement and rubber cements.
 81,888. G. Bergfeldt & Co., assignor to Hanover Vulcanite Co.—both of New York, N. Y. An illustration of a jockey between the words *Polo Club*. For rubber combs.

ISSUED NOVEMBER 17, 1914.

- 1,117,168. Pneumatic knee protector. T. J. Crowley, Long Island City, N. Y.
 1,117,207. Massage device. J. C. Mars, assignor to Fleur De Lis Specialty Co., both of Chicago, Ill.
 1,117,208. Massage device. J. C. Mars, assignor to Fleur De Lis Specialty Co.—both of Chicago, Ill.
 1,117,210. Flat valve. F. A. Mathys, Schenectady, N. Y.
 1,117,327. Water bottle. M. B. Clarke, Akron, Ohio.
 1,117,469. Fountain pen. O. G. Wiseman and E. R. George, both of Des Moines, Iowa.
 1,117,472. Spring tire. H. J. Augustine, assignor of one-half to R. S. Litchfield—both of Independence, Kan.
 1,117,481. Vehicle tire. J. T. Clark, Provo, Utah.
 1,117,526. Process of making a puncture sealing composition. G. E. Seely, Redwood City, Cal.
 1,117,530. Tire cover comprising alternate layers of rubber and textile material. R. Strong, Yarnborough, England.
 1,117,571. Life saving suit or garment. E. F. Hickman, assignor of one-half to A. Munden—both of Norfolk, Va.
 1,117,620. Semi-automatic winding machine. A. H. Adams, Brussels, Belgium, assignor to Western Electric Co., New York, N. Y.
 1,117,688. Packing comprising strips of rubberized fibrous material. M. Montgomery and H. M. Stewart, both of Philadelphia—and assigned to Montgomery Brothers, Inc.—all in Pennsylvania.
 1,117,691. Inflatable tire protector. C. E. Myers, Detroit, Mich.
 1,117,725. Artificial limb with inflatable socket cushion. A. E. Tullis, Fargo, N. D.
 1,117,774. Brake and brake liner. W. T. Bonner, assignor to The Asbestos Brake Co.—both of Trenton, N. J.
 1,117,803. Apparatus for forming pneumatic tires. M. A. Dees, assignor of one-half to The American Tire Co.—both of St. Louis, Mo., and one-half to The B. F. Goodrich Co., New York, N. Y.
 1,117,839. Resilient composition. A. J. Guidry, assignor of one-third to J. May, and one-third to C. Landry—all of New Orleans, La.
 1,117,840. Taper connection for rubber tube. C. F. Hamilton, Portland, assignor to Adjustable Liquid Gauge Co.—both in Oregon.
 1,117,915. Waterproof case comprising rubber gasket. W. W. Schenker, New York, N. Y.

Trade Marks.

- 78,922. Eberhard Faber, New York, N. Y. An illustration of a rule. For rubber erasers, etc.
 80,255. J. P. Southard, Reseller, N. J. The word *Barrett*. For rubber cement.
 80,591. The Ohio Manufacturing Co., Middletown, Conn. The word *Elva*. For dress shields.
 80,619. American Rubber Co., Inc., Jersey City, N. J. The words *Black Jack*. For chewing gum.
 81,672. W. L. McGuire, San Francisco, Cal. The word *Smogon*. For syringes.

ISSUED NOVEMBER 24, 1914.

- 1,117,994. Pneumatic tire. A. J. Freeman, New York, N. Y.
 1,118,122. Automobile tire. J. J. Gish, St. Paul, Minn.
 1,118,130. Shoe. J. C. Hester, Meriden, Conn.
 1,118,149. Rubber fabric and shoe. B. D. P. Co., assignor to The North British Rubber Co., Limited, both of Edinburgh, Scotland.
 1,118,158. Automobile gas bag for motorists. J. R. Gumbert, Akron, Ohio.
 1,118,157. Car tire comprising a liquid filler sleeve. J. W. Pottle, San Antonio, Tex.
 1,118,240. Automobile tire. W. A. Shaffer, Fort Madison, Iowa.
 1,118,306. Resilient wheel with pneumatic tire. John H. Hub, Golden City, Mo.
 1,118,359. Plastic wheel. J. K. Hiler, assignor of one-half to Kittie Collins—both of Chicago, Ill.
 1,118,461. Cushion for inflatable tubes and tires, comprising a series of air tight air cells. M. L. Adler, New York, N. Y.
 1,118,503. Apparatus for forming and vulcanizing rubber articles. N. W. McLeod, assignor to The American Tire Co.—both of St. Louis, Mo.
 1,118,504. Apparatus for forming and vulcanizing rubber articles. N. W. McLeod, assignor to The American Tire Co.—both of St. Louis, Mo.

- 1,118,541. Vehicle tire. J. W. Gannon and W. S. Webber, both of Montpelier, Vt.
 1,118,596. Vehicle tire. J. W. Gannon and W. S. Webber, both of Montpelier, Vt.
 1,118,757. Vehicle tire. J. W. Gannon and W. S. Webber, both of Montpelier, Vt.
 1,118,785. Automobile wheel. J. Laus, Jr., Oshkosh, Wis.
 1,118,786. Pneumatic wheel. J. Laus, Jr., Oshkosh, Wis.
 1,118,800. Pneumatic wheel. H. S. G. and L. Hubert, both of Elizabeth, N. J.
 1,118,801. Pneumatic wheel. H. S. G. and L. Hubert, both of Elizabeth, N. J.

Designs.

- 46,666. Vehicle tire. L. B. Decker, assignor to Rubber & Cellulose Harness Trimming Co.—both of Newark, N. J.
 46,670. Tire. G. W. Greene, assignor to Ten Broeck Tyre Co.—both of Louisville, Ky.
 46,671. Vehicle tire. B. C. H. W. Carter, Ohio.
 46,700. Vehicle tire. C. A. Schwartz, Richmond, Cal.

Trade Marks.

- 75,951. Tyer Rubber Co., Andover, Mass. The word *Tyrian*. For rubber automobile tire and inner tubes and rubber tubing.
 75,996. The Goodyear Tire & Rubber Co., Akron, Ohio. The words *Black Hills*. For rubber packing and machinery.
 78,790. The Fair, Chicago, Ill. The word *Champion*. For rubber garden hose.
 80,317. C. H. Daniels, Chicago, Ill. The words *Safety First*. For boots and shoes of leather, rubber, etc.
 80,730. The B & R Rubber Co., Brookfield, Mass. The word *Armortred*. For rubber soles and heels.
 81,174. The United States Distributing Co., New York, N. Y. The words *Pep Pep*. For chewing gum.
 81,458. A. & A. Rubber Co., South Framingham, Mass. The initials *A. & A. R. Co.* For soles and heels of shoes.

[NOTE. Printed copies of specifications of United States patents may be obtained from THE INDIA RUBBER WORLD office at 10 cents each, postpaid.]

GREAT BRITAIN AND IRELAND.

PATENT SPECIFICATIONS PUBLISHED.

The number given is that assigned to the Patent at the filing of the application, which in the case of those listed below was in 1913.

*Denotes Patents for American Inventions.

- [ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, NOVEMBER 4, 1914.]
 15,560 (1913). Pneumatic feet for typewriters, consisting of hollow rubber balls. Continental Caoutchouc-und Gutta-Percha Cie., Hanover, Germany.
 15,601 (1913). Catheter comprising a dilatable rubber bladder. Ges. G. Wolf, 18, Karlstrasse, Berlin.
 15,623 (1913). Game in which elastic bands are used. F. J. L. Bollhorn, Lauenburg-on-Elbe, Germany.
 *15,764 (1913). Rubber grip for the handle of a golf club, polo stick, or the like. W. H. Sandford, 606 West One Hundred and Thirtieth street, New York, N. Y., U. S. A.
 *15,838 (1913). Sock suspenders. B. W. Parker, New York, N. Y., U. S. A.
 15,878 (1913). Non-slipping attachments of rubber for shoes. J. H. Turner, Golf Club, Denham, Buckinghamshire.
 *15,910 (1913). Spring wheel with continuous outer rigid ring and rubber ring cushions. H. F. Spelschouse, 14 North First street, Philadelphia, Pa., U. S. A.
 15,963 (1913). Air chamber of a pneumatic tire. E. Brueck, 16, Rendagasse, Pilsen, Austria.
 16,033 (1913). Rubber composition for the manufacture of tires, etc. J. F. Monnot, 49, Old Broad street, London.
 [ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, NOVEMBER 11, 1914.]
 16,100 (1913). Stocking supporters. R. H. Wall and H. Wall, Limited, 4, Love Lane, Wood street, London.
 16,234 (1913). Tire consisting of segmental rings of alternate wood and rubber blocks in staggered arrangement, seated on a rubber bed. S. T. Richardson and R. Price, 3A, Rea street, Birmingham.
 16,241 (1913). Wheel tire. R. Reid, 50, Logan street, Polmadie, Glasgow.
 *16,288 (1913). Sock suspenders. A. T. Sanders, Chicago, Mass., U. S. A.
 16,316 (1913). Non-slip rubber pad for pedals, etc. W. B. Wright, 65, Woodgrange Road, Forest Gate, London.
 16,360 (1913). Spring wheel with rubber ring cushions. J. A. Bartz, 6, Kommandantenstrasse, Gross-Lichterfelde-West, Germany.
 16,372 (1913). Apparatus for drying india rubber. Bertrams, Limited, St. Katherine's Works; R. F. Gillespie, 58, Arden street, and P. M. Mathew, 7, Ravelston Park, all in Edinburgh.
 16,422 (1913). Golf bag comprising rubber disc. North British Rubber Co., Ltd., 11, H. C. Castle Mills, Leamington, Edinburg.
 16,423 (1913). Tire consisting of segmental rings of alternate wood and rubber blocks in staggered arrangement, seated on a rubber bed. S. T. Richardson and R. Price, 3A, Rea street, Birmingham.
 16,424 (1913). Tire consisting of segmental rings of alternate wood and rubber blocks in staggered arrangement, seated on a rubber bed. S. T. Richardson and R. Price, 3A, Rea street, Birmingham.
 16,425 (1913). Tire consisting of segmental rings of alternate wood and rubber blocks in staggered arrangement, seated on a rubber bed. S. T. Richardson and R. Price, 3A, Rea street, Birmingham.

- 16,618 (1913). Parcel post siphon heel with conical rubber valve plug. D. M. W. S. Limited, and J. W. Feargus, Enfield Road, Acton, London.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, NOVEMBER 18, 1914.]

- *16,647 (1913). Valve with rubber face. G. Hart, 1150 Erie avenue, Williamsport, Pa., U. S. A.
 16,665 (1913). Detachable heel with rubber layers. E. A. Lancaster, 273, Brunswick street, Nelson, Lancashire.
 *16,689 (1913). Spring wheel with continuous outer rigid ring and pneumatic cushions. W. G. Chipley, Third National Bank Building, Atlanta, Ga., U. S. A.
 16,697 (1913). Rubber covered bottle for animals. C. Allen, 35, North Frederick street, Dublin.
 16,728 (1913). Coagulating latex. A. E. Berry, "Abbotsleigh," Wandsworth, Essex, and A. Boake, Roberts & Co., 100, Carpenter's Road, Stratford, Essex.
 16,730 (1913). Rubber reinforced button hole for cellulose and like wearing apparel. M. Berger, 32, Neustiftgasse, Vienna.
 *16,972 (1913). Elastic fabrics. W. Kops, Bretton Hall, Eighty-sixth street, New York, N. Y., U. S. A.
 17,007 (1913). Rubber heel pad. W. J. Luxmoore, care of Messrs. Bridges, Savell & Co., 23, Red Lion Square, London.
 17,029 (1913). Balata belts with leather strips. J. Dawson & Son, Leather & Balata Works, Boultham, and A. Waddington, 32, Pennell street—10th in Lincoln.
 17,045 (1913). Segmental rubber tire sections. J. Whiteley, 7, Avondale street, Esmund Road, Cheetham Hill, Manchester.
 17,075 (1913). Feeding bottle. H. Johannes, Bucht-Strasse, Bremen, Germany.
 17,099 (1913). Rubber horseshoe pad. E. F. Clewer, Stoke Pound, Bromsgrove, Worcestershire.
 17,102 (1913). India rubber buffer or like springs, particularly for railway vehicles. C. W. C. Hine, "Moleway," Dorking, Surrey.
 [ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, NOVEMBER 25, 1914.]
 17,152 (1913). Stocking suspenders. F. Boltze, 6, Niederwaldstrasse, Dresden, Germany.
 17,193 (1913). Synthetic caoutchouc substances and intermediate products. H. Dreyfus, 69, Schutzenmattstrasse, Basle, Switzerland.
 17,195 (1913). India rubber. G. Bernstein, 49, Rue St. Georges, Paris.
 17,198 (1913). Collecting latex. J. R. Brown, Glugur, Penang, Straits Settlements.
 17,208 (1913). Tread blocks of hard rubber secured by screws. J. M. O'Brien, 10, Rydal Road, Streatham, London.
 *17,339 (1913). Toys with rubber springs. M. R. Chesney, Meny Building, Kansas City, Mo., U. S. A.
 17,506 (1913). Spring wheels with pneumatic cushions. S. A. Bhisey, 10, Airedale Road, High Road, Chiswick, London.
 17,582 (1913). India rubber, etc. L. Feval and J. de La Fresnaye, 2, Avenue St. Philibert, Paris.
 17,592 (1913). Rubber heel support. F. J. Wood, 3, Rawes street, Burnley, Lancashire.

THE FRENCH REPUBLIC.

PATENTS ISSUED (with Dates of Application).

- 471,639 (March 16). Interchangeable heel. A. A. Chaussée.
 471,795 (May 4, 1914). Plastic product for use with all descriptions of wheel tires. C. A. Prada.
 471,826 (March 9). Protective cover for vehicle wheel tires. R. Royard de Lamotte.
 471,852 (May 6). Perfected vulcanizing press. A. Lambrette.
 471,853 (May 6). Improvements in vulcanizing presses, boilers and similar appliances. A. Lambrette.
 471,857 (May 6). Mudguard for all kinds of vehicles. C. Giefing.
 471,874 (May 6). Improvements in manufacture of tires. R. Strong.
 471,913 (July 22, 1913). Process intended to separate vulcanized rubber from fabrics and from metallic and similar portions to which it adheres or with which it is mixed. J. Frydemane.
 471,996 (July 23, 1913). Process for regeneration of vulcanized rubber. J. Frydemane.
 472,051 (March 21, 1914). Improvements in wheels. E. F. Goodyear.
 472,052 (March 21). Improvements in wheels. E. F. Goodyear.
 472,167 (May 13). Pneumatic wheel fitting without air chamber. E. Dive.
 472,219 (May 14). Improvements in bicycle air chambers. D. H. C. Russell.
 472,186 (May 17). Appliance for immediately detaching the internal pressure of a tire and particularly of a pneumatic tire. L. Badois.
 472,215 (May 18). Improvements in machines for making objects or substances composed of rubber or other adhesive material and fiber. The Azalay Syndicate, Limited.
 472,245 (May 15). Mass of rubber and products obtained therefrom. E. Franz.
 472,264 (May 15). Elastic wheel tires for automobiles or other road vehicles. A. Tawan.
 472,268 (May 16). Apparatus for vulcanizing soles of footwear. F. A. Antoni.
 472,339 (May 18). Manufacture of a solid elastic body. "Pneumelastium" Company, Limited.
 472,345 (May 18). Mudguard for all kinds of vehicle wheels, specially adapted to automobiles. F. Malraux.
 472,349 (May 18). Elastic tire for wheels. M. Miller.
 472,349 (May 18). Cover for pneumatic tire and other purposes. Gova Tire Company, Limited.
 472,344 (March 4). Improvements in the manufacture of carcasses of pneumatic tires. The India Rubber & Rubber Co.

472,489 (April 29). Pneumatic mechanism for all automobile vehicles. A. Vincent.

[NOTE: Partial copies of specifications of French patents can be obtained from R. B. B. International Counsel, 16, Avenue de Valenciennes, Paris, at 50 cents each, postpaid.]

THE GERMAN EMPIRE.

PATENTS ISSUED (with Dates of Validity).

- 280,111, Class 39b (October 11, 1913). Process for manufacture of artificial sponge. Philipp Roder Braun, Reich, Alt-Ges., Wien.
- 280,197, Class 39b (April 16, 1913). Process for treatment of synthetic substances, resins, rubber, chlorol through polymerization of butadiene and its homologs. Badische Anilin- und Soda-Fabrik, Ludwigshafen am Rhein.
- 280,198, Class 39b (January 1, 1914). Process for accelerating the vulcanization of natural or artificial rubber. Farbentabellen vorm. Friedr. Bayer & Co., Leverkusen b. Köln.
- 280,482, Class 63c (November 27, 1913). Pneumatic tire. A. W. Livingston, Oakland, Cal.
- 280,483, Class 63c (November 9, 1913). Appliance for indicating escape of air from pneumatic tires. Automobilwerk Max Schachtschabel & Co., Halle a. S.
- 280,484, Class 63c (November 26, 1913). Anti-skid appliance for tires. T. J. Clark, Portland, Ore.
- 280,596, Class 12c (May 28, 1911). Process for production of isoprene. Badische Anilin- und Soda-Fabrik, Ludwigshafen am Rhein.
- 280,660, Class 45f (December 3, 1913). Rubber tapping tool. Jules Bosch, Kheorinan, near Manomajaya, Java.
- 280,763, Class 71c (September 20, 1913). Apparatus for vulcanizing shoe soles. Friedrich August Antoni, Köln.
- 280,848, Class 39a (November 13, 1913). Process for separation of rubber, gutta percha or balata from the latices containing these gums. D. Heinrich Collosens, Regensburger Strasse, 27, Berlin.
- 280,959, Class 39b (March 21, 1912). Process for production of rubber. Farbentabellen vorm. Friedr. Bayer & Co., Leverkusen b. Köln.
- 280,988, Class 45f (October 25, 1913). Apparatus for tapping rubber and other trees. Georg M. von Hassel, Bezener Strasse, 6, Berlin.
- 280,944, Class 63c (October 5, 1913). Cellular tires, air cells of which are in connection with the open air. Adolf Böttcher, Hammerdeich, 106/110, Hamburg.

GERMAN PATENTS IN FRANCE.

In the matter of French patents issued to Germans, a number of manufacturers in the south of France have urged on the government the unwisdom of the proposed drastic measures as being likely to cause retaliatory action in Germany, the patents issued to French inventors in Germany and Austria possessing special value which they would thus soon lose. French manufacturers appreciate the value of German patents, while in number they may be less than those issued in France to German inventors.

THE MARKET FOR CHEMICALS AND COMPOUNDING INGREDIENTS.

THIS is the season when dullness is most apparent in such chemicals as are used in common in the paint and rubber trades.

The "Massepequa," en route from Germany, is bringing 58,300 pounds of lithopone and 12,654 pounds of chemicals. The "Matanzas," which was chartered here by a syndicate of dye and chemical importers and dealers, arrived with a full load of 3,000 tons of dyes, chemicals and medicines, and is returning for another load. The oil tanker "Sun" arrived on November 29 with 4,100 tons of German chemicals, etc. Recently the "El Paso" has been chartered for the return trip by a firm of chemical importers. She sailed from here with cotton. The steamer "Albatross" is also expected to arrive about the first of the year with a good sized cargo.

It is customary to add 25 per cent. to the bills for chemicals arriving from Germany on account of the war. The charge on the first cargo of the "Matanzas" was \$35 per ton.

The German government will allow of the exportation of dyes and chemicals and medicines only in American steamers consigned to American importers who guarantee that they will not be diverted to the use of its allied enemies.

The English government has again prohibited the export of aniline oil, and the price has soared to 50 or 60 cents per pound. The United States imported 115,951 pounds of aniline oil in October, and exported 3,000,000 pounds of zinc compounds.

It is reported that a plant for producing dyes and chemicals will be built by the Benzol Products Co., which is controlled by

Barrett, who also controls the coal tar industry in the United States, the General Chemical Co., who are large manufacturers of chemicals, and the Somo-Solvay Co., who are in control of the Solvay process of producing coke in by-product ovens, and make immense quantities of tar and benzol. The plant is to be built at Marcus Hook, Pennsylvania, and will employ 1,000 men.

The imports by England and Germany of antimony sulphide and oxide on the contraband list. This will prevent shipments through the customary channels and result in consignments being made in a roundabout way, causing higher prices. Imported barytes will also go higher, as advices have been received by New York agents of European houses that no more supplies will be shipped.

PRICES OF CHEMICALS AND COMPOUNDING INGREDIENTS.

December 30, 1914.

Acetic acid, 28 per cent.	lb.	\$ 0.0134	@ \$ 0.02
Acetic acid, glacial	lb.	07 3/4	@ 08 1/4
Alba whitening	ton	8.00	@ 13.00
Aluminum flake	lb.	.011	@
Aniline oil	lb.	.50	@ .60
Antimony, crimson, sulphuret of	lb.	.40	@ .50
Antimony, golden, sulphuret of	lb.	.28	@ .30
Arsenic sulphide	lb.	.12	@
Asbestine	ton	16.00	@ 18.00
Barytes, domestic	ton	21.00	@ 23.00
Bayberry wax	lb.	.24	@ .27
Beeswax, crude yellow	lb.	.30	@ .32
Benzol, 90 per cent.	gal.	.30	@
Black hypo	lb.	.27	@ .30
Blanc fixe	lb.	.04	@ .05
Cadmium, yellow	lb.	1.25	@ 1.50
Carbon bi-sulphide	lb.	.06	@ .07
Carbon gas	lb.	.04	@ .06
Carbon tetra-chloride, drums	lb.	.15	@ .16
Ceresin wax, white	lb.	.12	@ .22
Chalk, L. B.	lb.	.04 1/2	@ .05 1/2
China clay, domestic	ton	8.00	@ 9.00
Coal tar naphtha	gal.	.28	@
Corn oil	lb.	.05	@
Fossil flour	ton	35.00	@
Glycerine, C. P., bulk	lb.	.23	@ .24
Graphite	lb.	.40	@ .60
Green oxide of chromium	lb.	.30	@ .35
Iron oxide	lb.	.02 1/2	@ .08 1/2
Infusorial earth	ton	30.00	@
Ivory, black	lb.	.08	@ .12
Lampblack	lb.	.03 3/4	@ .07
Lead, sublimed white	lb.	.07	@
Lead, white (basic carbonate)	lb.	.05	@ .05 1/4
Lead, white (basic sulphate)	lb.	.04 3/4	@ .05
Linseed oil, carload	gal.	.46	@
Litharge	lb.	.05	@ .05 1/2
Lithopone, American	lb.	.04	@ .04 1/2
Magnesia, carbonate	lb.	.04 1/4	@ .05 1/2
Magnesia, calcined, powder	ton	40.00	@ 45.00
Naphtha, V. M. & P., deodorized	gal.	.09	@
Naphtha, 70 deg.	gal.	.23	@
Naphtha, 76 deg.	gal.	.26	@
Orange mineral, domestic	lb.	.08 1/2	@ .12
Ozokerite, refined yellow	lb.	.25	@ .30
Paraffine wax, domestic 120 m. p.	lb.	.04 1/2	@ .04 3/4
Pumice stone, powder	lb.	.01 1/2	@ .02
Prussian blue	lb.	.46	@ .48
Rape seed oil	gal.	.75	@
Red lead	lb.	.05 1/4	@
Red oxide, domestic	lb.	.05 1/2	@ .07
Rosin oil	gal.	.30	@ .55
Shellac, fine orange	lb.	.16	@ .18
Soapstone, powdered	ton	10.00	@ 12.00
Sulphur chloride, in drums	lb.	.06 1/2	@
Sulphur, flowers	ton	2.20	@ 2.40
Talc, American	ton	15.00	@ 20.00
Ultramarine blue	lb.	.04	@ .14
Vermilion, English	lb.	.90	@ 1.00
Whiting, commercial	cwt.	.45	@ .55
Whiting, Paris white	cwt.	.70	@ .75
Whiting, English cliff-stone	cwt.	.75	@ 1.00
Zinc oxide, American process	lb.	.053 1/2	@
Zinc oxide, French process, red seal	lb.	.073 1/2	@
Zinc oxide, French process, green seal	lb.	.083 1/4	@
Zinc oxide, French process, white seal	lb.	.09 1/4	@

THE RUBBER SCRAP MARKET.

IN the early days of the month collections of boots and shoes were light, which caused dealers to look for higher prices. It was, however, understood that there were some large stocks of waste, which would affect the possibilities of an advance. Dealers were paying $7\frac{3}{8}$ @ $7\frac{1}{4}$ cents and getting $7\frac{3}{8}$ @ $7\frac{3}{4}$ cents from the mills. Rumors of sales, or offers, a little later in the month, at 8 cents were not confirmed. In the closing days of the month it becomes evident that for good-sized lots reclaimers will have to pay 8 cents. Some business has been proposed to collectors by dealers at the equivalent of the price offered by the mills. The future of the waste shoe market depends in a large measure on the extent of crude rubber importations.

Trimmed arctics are firm. Auto tires have realized $4\frac{5}{8}$ @ $4\frac{3}{4}$ cents, though the quantity handled at latter price is doubtless limited. Dealers have been offering \$4.20@4.50. Solid tires have realized $4\frac{1}{2}$ @ $4\frac{3}{4}$ cents from mills, and bicycle tires $3\frac{1}{4}$ cents. Inner tubes have been held firmly, dealers paying 23 cents for No. 1, and getting from mills about 24 cents. Accumulations of tubes are being held by dealers.

Collections from the West are coming in slowly, and dealers are looking for higher prices from that quarter. In Boston the advances on crude rubber led to a firm tone in No. 1 tubes. Collectors in Philadelphia have not been sending in much material. Scrap rubber dealers, while meeting with a dull trade, are looking for better times in 1915.

RUBBER SCRAP PRICES PAID BY CONSUMERS FOR CARLOAD LOTS.

New York, December 30, 1914.

	Per Pound.
Boots and shoes.....	$7\frac{3}{8}$ @ $7\frac{3}{8}$ cents
Trimmed arctics.....	$5\frac{3}{8}$ @ $5\frac{3}{4}$
Auto tires.....	$4\frac{5}{8}$ @ $4\frac{3}{4}$
Solid tires.....	5 @ $5\frac{1}{4}$
No. 1 inner tubes.....	21 @22
No. 2 inner tubes.....	$11\frac{1}{2}$ @ $12\frac{1}{2}$
Red tubes.....	13 @ $13\frac{1}{2}$
Bicycle tires.....	$2\frac{3}{4}$ @ 3
Irony tires.....	$1\frac{3}{4}$ @ $2\frac{1}{4}$
No. 1 auto peelings.....	$8\frac{1}{4}$ @ $9\frac{1}{4}$
Mixed auto peelings.....	$6\frac{3}{4}$ @ 7
No. 1 soft white rubber.....	$10\frac{1}{4}$ @
White wringer rubber.....	$6\frac{1}{4}$ @ $7\frac{1}{4}$
No. 1 red scrap.....	$9\frac{1}{4}$ @
Mixed red scrap.....	$6\frac{1}{4}$ @ $7\frac{1}{4}$
Mixed black scrap.....	$2\frac{1}{4}$ @
Rubber car springs.....	$3\frac{1}{4}$ @
Horse shoe pads.....	$2\frac{1}{4}$ @ $2\frac{3}{4}$
Matting and packing.....	$1\frac{1}{2}$ @ $\frac{3}{4}$
Garden hose.....	$5\frac{1}{8}$ @ $\frac{3}{4}$
Air brake hose.....	3 @ $3\frac{3}{4}$
Cotton fire hose.....	$2\frac{1}{4}$ @

COMPARATIVE STATISTICS OF SCRAP RUBBER IMPORTS AND EXPORTS.

Figures for the month of October show United States imports of scrap rubber as follows:

	Pounds.	Value.
October, 1913.....	1,788,409	\$132,770
October, 1914.....	967,994	63,113
First 10 months of 1913.....	33,534,559	2,927,205
First 10 months of 1914.....	17,504,670	1,254,104

Exports:

October, 1913.....	322,543	\$45,013
October, 1914.....	70,774	5,731
First 10 months of 1913.....	4,906,970	672,261
First 10 months of 1914.....	4,056,071	393,737

NATIONAL ASSOCIATION OF WASTE MATERIAL DEALERS.

The usual quarterly meeting of the National Association of Waste Material Dealers was held on December 15 at the Hotel Astor, New York, under the chairmanship of President Birkenstein, when various subjects were taken up, including the advance in freight rates on certain lines of waste materials. The report of the Western Traffic Committee referred to the fact of the old classification having been restored, under which combined shipments of metals, rubber and rags can be made.

CONSERVATION OF WASTE.

In his recent address at the Pittsburgh Publicity Association, Newell J. Lewis, general manager of the Pennsylvania Paper Stock Co., quoted a statement of Theodore Hofeller, of Buffalo, who has been thirty years in the waste business, as to rubber waste. The latter authority had estimated that during the year 1915 10,000,000 automobile tires would be manufactured in the United States, which, when worn out, would realize \$10,000,000, on the basis of 5 to 6 cents per pound. The general advantages of the utilization of waste were forcibly presented by Mr. Lewis.

BALTIMORE FIRM CHANGES NAME.

With quarters still at 428 East Saratoga street and 428 Falls Way, Baltimore, the firm hitherto known under the name of H. Klaff & Co., will in future be styled the "National Metal and Pipe Supply Co." It will carry scrap iron as well as rubber and other waste products.

SOME AUTOMOBILE NOTES.

The United States exported during the first nine months of 1914 20,167 automobiles—637 commercial, valued at \$1,066,545, and 19,530 passenger at \$17,209,964—and parts, exclusive of engines, and tires, to the amount of \$4,451,163. This is a slight decrease from the figures for the same period in 1913, when a total of 20,953 vehicles were exported, worth \$20,301,858, and parts valued at \$4,448,792. The total export of automobiles for the fiscal year ending January 30 last reached \$40,000,000. Imports into the United States up to October 1, 1914, included 186 automobiles, worth \$293,601, with parts, exclusive of tires, \$698,624.

It is estimated that there will be made in Canadian factories during 1915 36,000 cars of United States design, the predicted production there of Fords alone being 30,000. Canada's imports of automobiles from the United States for the first nine months of 1914 totaled 3,854 cars, against 5,260 for the same period in 1913.

Three hundred automobile trucks have recently been purchased in Chicago by representatives of the Russian government, 200 three-ton and 100 five-ton.

The Massachusetts Highway Association received during the fiscal year ending November 30 last fees for automobile registration and licenses amounting to \$925,964, an increase of \$700 over the receipts for the previous year. During the year there were registered 77,246 cars, against 62,660 for the previous fiscal year, and the licensed drivers increased from 81,144 to 99,532. The amount received in fees will be expended for road maintenance and improvement.

A "Made in the U. S. A. Industrial Exposition" will be held at the Grand Central Palace, New York, March 6 to 13, in the movement to establish the "Made in the U. S. A." slogan or national trade-mark and increase American industry and trade. This exposition is intended to show "American Made" and "American Grown" products in practically all branches of business.

The report of the agricultural station of Annam says that the ten trees in the station in Hué which have served for experimental purposes do not develop freely. Their progress is not very satisfactory, and it seems that the climatic conditions of Central Annam differ too much from those in their native country.

Review of the Crude Rubber Market.

AS a result of embargo conditions, New York prices have advanced during December both for Para and plantation grades. In the former, the month opened at 70@71 cents, the price remaining within about a cent of that figure until the 16th, when it attained 73@74 cents. On the 18th it further advanced to 75@76 cents, at which it remains.

First latex crepe stood on December 1 at 75@76 cents, from which point it rose by the 15th to 78@80 cents, and by the 18th to 85@87 cents, at which it has since remained.

The month is closing with a quiet market, small stocks, prices steady and few buyers. The manufacturers are not in the market, and any evidence of buying would result in advanced prices. Stocks of plantation grades are especially small, and the only cargo afloat is on the "Ghazee," now due to arrive. This was the last ship to leave Singapore after the embargo went into effect. Para stocks from Brazil are arriving regularly. About 3,000 tons have arrived during the month.

The Booth Line steamship "Denis," from Manaos and Para, is due in New York December 29, with 950 tons. The Lloyd Brasileiro steamship "Sergipi," calling at Para, is due in New York January 10, with 270 tons. The Booth Line steamship "Boniface," from Manaos and Para, is due January 12 with 690 tons.

All of this rubber was sold in advance, and therefore will not affect prices on arrival.

The report that large quantities of rubber are being shipped from Para to Italy is not confirmed. A small lot of 43 tons was shipped via New York, but encountered difficulty in transshipping at this port. Another lot of 28 tons was shipped to Italy from Para by way of Rio de Janeiro. As Italy's embargo is in force, this rubber cannot eventually arrive in Germany.

Prices of plantation rubber in London were normal at the first of the month: First latex crepe, 2s. 1½d. [52.2 cents]; ribbed smoked sheet, 2s. 4½d. [57.77 cents]. The market has held steady since then, with a tendency towards lower figures. Latest advices show but little change, with first latex crepe at 2s. 0d. [48.65 cents], and ribbed smoked sheet 2s. 3d. [54.73 cents].

"Macson" says stocks look small, but reminds the trade of the large quantities of rubber seized by England at Gibraltar and the north of Scotland. One small sale of this rubber has recently been made in Liverpool by order of the Prize Court brokers. Latest advices mention that the only market feature is the unusually large shipments to Canada.

Singapore auctions are held regularly with a good demand for all grades. "The India Rubber Journal" reports large business done by growers for direct shipment to America, and deplores the diverting of London's trade.

NEW YORK QUOTATIONS.

Following are the quotations at New York one year ago, one month ago, and December 30, the current date:

PARA.	Jan. 1 '14	Dec. 1, '14.	Dec. 30, '14.
Islands, fine, new	60 @61	60@61	69@70
Islands, fine, old .....	.....	62@64	.....
Upriver, fine, new.....	73 @74	71@..	..@75
Upriver, fine, old.....	76 @79	73@75	..@78
Islands, coarse, new.....	28 @29	32@33	37@38
Upriver, coarse, new.....	44½@45	52@53	59@60
Upriver, coarse, old.....	.....	.....	.....
Cameta	36 @37	33@35	..@40
Caucho, upper	44 @45	52@53	..@61
Caucho, lower .....	.....	50@51	..@58

PLANTATION HEVEA.

Smoked sheet ribbed.....	60 @61	82@84	91@93
First latex crepe	56 @57	75@76	86@87
Line sheets and biscuits			
unsmoked	56 @57	66@68	.....

CENTRALS.

Grimo .....	.....	46@47	58@60
Esmeralda, sausage	39 @40	46@47	58@60
Guayaquil, strip .....	.....	.....	.....
Nicaragua, scrap	38 @39	45@46	.....
Panama .....	.....	.....	.....
Mexican plantation, sheet.....	.....	.....	.....
Mexican, scrap	35 @39	45@46	58@60
Mexican, slab .....	.....	.....	.....
Mangabeira, sheet .....	.....	42@44	44@45
Guayule	35 @..	34@..	38@39
Balata, sheet .....	.....	52@53	52@53
Balata, block	45 @50	43@44	41@42

AFRICAN.

Lopori, ball, prime.....	44 @48	No supply	70@75
Lopori, strip, prime.....	.....	No supply	.....
Aruwim .....	.....	No supply	.....
Upper Congo, ball red.....	.....	No supply	.....
Ikelemba .....	.....	No supply	.....
Sierra Leone, 1st quality.....	.....	No supply	.....
Massai, red .....	.....	No supply	.....
Soudan Niggers .....	.....	No supply	.....
Cameroon, ball	28 @31	45@..	..@55
Benguela .....	.....	34@..	26@38
Madagascar, pinky .....	.....	.....	.....
Acra, flake	22 @23	28@..	..@35

EAST INDIAN.

Assam .....	.....	.....	.....
Pontianak .....	.....	.....	7½@ 8
Borneo II, or 2nd.....	.....	40@..	.....

New York.

In regard to the financial situation, Albert B. Beers (broker in crude rubber and commercial paper, No. 68 William street, New York) advises as follows: "The easier rates and improved demand for commercial paper, noted in my last report for the latter part of November, have continued through December with further ease, the best rubber names going at 4½ to 5 per cent., and those not so well known 5½ to 6½ per cent."

NEW YORK PRICES FOR NOVEMBER (NEW RUBBER.)

	1914.	1913.	1912.
Upriver, fine	\$0.63 @ \$0.71	\$0.73 @ \$0.80	\$1.02 @ \$1.08
Upriver, coarse .....	.46 @ .53	.46 @ .49	.80 @ .84
Island, fine .....	.50 @ .61	.66 @ .70	.94 @ 1.00
Island, coarse .....	.27 @ .32	.28 @ .31	.53 @ .58
Cameta .....	.29 @ .34	.36 @ .37	.55 @ .58

PARA STATISTICS.

Stock, October 31.....	tons	1,270
Entries for November .....	.....	2,960
Total .....	.....	4,230
Exports .....	.....	1,810
.....	.....	2,420
Held for shipment to America.....	tons	610
Second hands .....	.....	1,660
First hands .....	.....	150
Total .....	.....	2,420

Arrivals of Guayule rubber for the nine months ending September were 1,075,676 pounds, valued at \$440,262, against 4,675,798 pounds, valued at \$2,043,813, last year. Imports of gutta percha for the nine months were 1,757,516 pounds against 381,131 pounds in same time last year, and 612,708 pounds in 1912.

Singapore.

General & Co. report [November 18, 1914]

The rubber market in Singapore has been very quiet since the 1st of November, owing to the fact that the United Kingdom has been closed to rubber imports from the United States, and the market has been very quiet since the 1st of November.

At the end of the week, the market was somewhat better, and the price of the standard grade was 11.50 cents, and the price of the first grade was 11.00 cents. The price of the second grade was 10.50 cents, and the price of the third grade was 10.00 cents.

The market was very quiet since the 1st of November, and the price of the standard grade was 11.50 cents, and the price of the first grade was 11.00 cents.

	In Singapore	Sterling equivalent	Equivalent
	per 100 lb.	in London	per pound
Standard	\$10.00	2	48.65 @ 53.46
Sheet	8.00	1	40.79 @ 47.88
Sheet	7.00	1	36.99 @ 40.02
Sheet	6.00	1	31.69 @ 35.97
Sheet	5.00	1	27.11 @ 33.44
Sheet	4.00	1	22.04 @ 28.38
Sheet	3.00	1	18.24 @ 21.53

*Per 100 lb. of rubber.

General & Co. report [November 18, 1914]

IMPORTS FROM PARA AT NEW YORK.

[The figures here are Weight in Pounds.]

NOVEMBER 28.—By the steamer *Stephen* from Pará and Manaos:

	Fine	Medium	Coarse	Caucho	Total
Arnold & Zeiss	25,000	22,700	26,600	15,000	397,200
Henlerson & Korn	194,700	9,000	42,400	11,100	257,200
Meyer & Brown	115,800	26,900	87,000	10,200	239,900
General Rubber Co.	81,500	13,400	20,700	600	116,200
Robinson & Co.	8,700	22,600	112,300	—	—
H. A. Astlett & Co.	64,300	6,900	17,400	4,700	93,300
Aldens' Successors, Ltd.	32,000	5,300	10,000	—	47,300
Adolph Hirsch & Co.	22,000	2,300	2,400	—	26,700
Cowley & Co.	5,800	2,000	900	—	8,700
Total	868,700	88,500	300,000	41,600	1,298,800

NOVEMBER 28.—By the steamer *Stephen* from Itacoatiara:

Henlerson & Korn	37,100	1,700	15,000	900	54,700
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DECEMBER 10.—By the steamer *Rio de Janeiro*, from Pará:

Arnold & Zeiss	84,800	1,500	—	—	86,300
Meyer & Brown	150,600	7,000	8,000	—	165,600
Hagenmeyer & Brunn	74,500	—	—	—	74,500
G. Amsinck & Co.	10,600	—	—	—	10,600
C. S. Smith & Sicken	5,800	1,000	400	—	7,200
Rumsey & Greutert Co., Inc.	3,500	200	200	—	3,900
Total	329,800	8,200	10,100	—	348,100

DECEMBER 16.—By the steamer *Justin*, from Pará and Manaos:

Meyer & Brown	288,400	33,000	328,600	65,900	715,900
Arnold & Zeiss	327,800	66,100	101,300	62,200	557,400
General Rubber Co.	277,400	59,400	36,100	1,000	373,900
Aldens' Successors, Ltd.	206,000	25,000	58,000	24,000	313,000
Henlerson & Korn	152,600	22,600	57,100	35,300	267,600
Hagenmeyer & Brunn	170,400	—	—	—	170,400
G. Amsinck & Co.	88,800	2,100	19,900	16,000	126,800
W. R. Grace & Co.	40,400	1,900	21,500	21,000	84,800
Robinson & Co.	68,000	11,100	2,400	—	81,500
Johnstone, Whitworth & Co.	58,400	11,700	10,500	—	80,600
Davies, Farmer & Co.	35,300	—	—	—	35,300
H. A. Astlett & Co.	16,600	1,700	6,600	1,800	26,700
N. Y. Edison Co.	11,800	—	—	—	11,800
S. Ross & Co.	4,500	600	1,100	600	6,800
Total	1,788,900	235,100	648,100	227,800	2,899,900

DECEMBER 22.—By the steamer *Minas Geraes*, from Pará:

Arnold & Zeiss	25,000	6,400	42,500	—	74,900
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OTHER NEW YORK ARRIVALS.

CENTRALS.

[*This sign, in connection with imports of Centrals, denotes Guayule rubber.]

POUNDS.

NOVEMBER 7.—By the *Nightingale*—Mexico:

G. Amsinck & Co. 4,000

Adolph Hirsch & Co. 2,000

N. Y. Edison Co. 19,000

NOVEMBER 15.—By the *St. Michel*—Colombia:

G. Amsinck & Co. 5,000

NOVEMBER 15.—By the *St. Michel*—New Orleans:

J. S. Smith & Co. 10,000

NOVEMBER 15.—By the *St. Michel*—Cuba:

G. Amsinck & Co. 1,000

NOVEMBER 15.—By the *St. Michel*—Cuba:

G. Amsinck & Co. 2,000

NOVEMBER 15.—By the *St. Michel*—Cuba:

G. Amsinck & Co. 2,000

NOVEMBER 15.—By the *St. Michel*—Cuba:

G. Amsinck & Co. 2,000

NOVEMBER 15.—By the *St. Michel*—Cuba:

G. Amsinck & Co. 2,000

NOVEMBER 15.—By the *St. Michel*—Cuba:

G. Amsinck & Co. 2,000

NOVEMBER 15.—By the *St. Michel*—Cuba:

G. Amsinck & Co. 2,000

Meyer & Brown	81,200	2,600	71,800	600	155,700
Aldens' Successors, Ltd.	27,300	3,000	25,000	—	55,300
Total	133,500	12,000	134,200	600	285,300

Plantation Rubber from the Far East.

EXPORTS OF CEYLON GROWN RUBBER.

(From January 1 to November 16, 1913 and 1914. Compiled by the Ceylon Chamber of Commerce.)

To	1913.	1914.
Great Britain	12,233,999 pounds	15,940,685
United States	5,320,411	9,108,791
Belgium	3,358,739	2,984,009
Australia	417,593	571,773
Germany	237,657	1,037,415
Japan	222,605	226,301
Straits Settlements	97,120	42,535
Italy	42,488	1,772
Austria	30,097	—
France	15,682	320,152
Russia	11,301	105,212
India	1,381	1,050
Holland	992	—

Total 21,990,065 30,339,695

(Same period 1912, 11,586,700; same period 1911, 5,195,619.)

To arrive at the approximate quantity of Ceylon rubber exported for 1914 to date, deduct the quantity from the total exports. In previous years the exports of Ceylon rubber only were given.

The export figures of rubber for 1914 in the above table include the imports re-exported, viz., 3,317,075 pounds.

TOTAL EXPORTS FROM MALAYA.

(From January to dates named. Reported by Barlow & Co., Singapore.)

These figures include the production of the Federated Malay States, but not of Ceylon.)

To—	Singapore.	Malacca.	Penang.	Port Swet-	Total.
	Nov. 4.	Oct. 31.	Sept. 30.	Nov. 7.	
Great Britain	21,266,446	4,055,625	13,798,133	22,841,506	61,961,710
Continental	1,885,051	36,873	522,133	1,816,538	4,260,595
Japan	1,226,490	—	—	—	1,226,490
Ceylon	297,245	—	763,333	1,389,233	2,449,811
United States	10,732,448	15,878	864,534	244,209	11,857,069
Australia	110,369	—	—	—	110,369
Total	35,518,049	4,108,376	15,948,133	26,291,486	81,866,044
Same period, 1913.	23,220,183	—	11,334,533	24,467,626	59,021,342
Same period, 1912.	11,761,547	—	6,737,897	17,549,365	36,048,809
Same period, 1911.	5,400,798	—	3,565,100	10,221,779	19,187,677

STRAITS SETTLEMENTS RUBBER EXPORTS.

A cable received by the Malay States Information Agency from the Colonial Secretary, Singapore, states that the export of plantation rubber during the month of October amounted to 2,006 tons as compared with 1,602 tons in the previous month and 1,144 tons in the corresponding month last year.

The following table gives the comparison month by month for three years:

	1912.	1913.	1914.
January	253	784	1,181
February	274	743	1,703
March	427	898	1,285
April	387	762	1,548
May	431	814	1,309
June	398	812	1,480
July	720	1,120	1,584
August	597	1,315	1,325
September	550	1,057	1,602
October	—	1,144	2,006
Total	4,426	9,449	15,023

DECEMBER 8.—By the *Alba*—Galveston: *22,500

Various

DECEMBER 8.—By the *Monterey*—Mexico:

Federico, Nardo

DECEMBER 10.—By the *S. S. Prince*—Bahia:

Adolph Hirsch & Co.

DECEMBER 11.—By the *Mexico*—Mexico:

Lawrence Johnson & Co.

DECEMBER 14.—By the *Colon*—Colon:

G. Amsinck & Co.

Pablo, Calvet & Co.

J. S. Sanabria & Co.

C. E. Griffin

W. R. Grace & Co.

M. L. Calientes

J. H. Schaefer

Wessels, Kulerkampff & Co.

96,890

DECEMBER 14.—By the <i>Tenadores</i> —Colombia:		
A. Held.....	3,500	
DECEMBER 14.—By <i>Li Norte</i> —Galveston:		
Various.....	33,500	
DECEMBER 16. By the <i>Voca</i> —Galveston:		
Various.....	22,500	
DECEMBER 17. By the <i>Artilla</i> —Mexico:		
G. Amsinck & Co.....	15,000	
E. Steiger & Co.....	11,000	
Hamburger & Stack.....	2,200	
American Trading Co.....	25,000	
Various.....	10,000	63,200

DECEMBER 18. By the <i>Amirante</i> —Colombia:		
R. del Castillo & Co.....	800	
A. Held.....	1,200	
Various.....	500	2,500

DECEMBER 21. By <i>Li Mund</i> —Galveston:		
Various.....	45,000	

DECEMBER 21. By the <i>Adriatic</i> —Colombia:		
Lawrence Johnson & Co.....	3,800	
Lanham & Kemp.....	2,900	
Piza, Nephews & Co.....	1,800	
Public, Calvet & Co.....	5,100	
Various.....	1,100	14,700

DECEMBER 22.—By the <i>Saramacca</i> —Port Limon:		
Isaac Blanchon & Bros.....	1,000	
Eggers & Henderson.....	200	1,200

DECEMBER 22.—By the <i>Minas Geraes</i> —Bahia:		
Adolph Hirsch & Co.....	45,000	
Aldens' Successors, Ltd.....	27,600	72,600

DECEMBER 26. By the <i>Mansueta</i> —Mexico:		
G. Amsinck & Co.....	4,500	
Harburger & Stack.....	600	
W. Avis & Co.....	3,000	
Graham Humbley & Co.....	1,500	9,600

AFRICAN.

DECEMBER 5.—By the <i>Isle of Mull</i> —Lisbon:		
Various.....	154,500	

DECEMBER 7. By the <i>Glenstrae</i> —London:		
Robinson & Co.....	33,500	

DECEMBER 8. By the <i>Britannia</i> —Lisbon:		
Various.....	35,000	

DECEMBER 10.—By the <i>Hateanan</i> —Bona:		
P. Mali.....	58,500	
W. H. Page.....	27,500	
American Congo Co.....	21,000	107,000

DECEMBER 21.—By the <i>Adriatic</i> —Liverpool:		
Various.....	2,200	

DECEMBER 23.—By the <i>Dundrennan</i> —Lisbon:		
Carlton & Moffat.....	135,000	

DECEMBER 26. By the <i>Hero</i> —Lisbon:		
C. B. Richard & Co.....	200,000	
Ed. Maurer.....	82,000	
Robt. Badenhop.....	22,500	
W. H. Stiles.....	11,200	
Various.....	57,500	373,200

DECEMBER 28.—By the <i>Chicago</i> —Havre:		
Meyer & Brown.....	26,700	
Various.....	40,000	66,700

EAST INDIAN.

[*Denotes plantation rubber.]

NOVEMBER 23. By the <i>Marquette</i> —London:		
Robert Badenhop.....	11,200	
Arnold & Zeiss.....	11,200	
Henderson & Korn.....	13,500	
Ed. Maurer.....	7,700	
Earle Bros.....	8,600	
General Rubber Co.....	225,000	
Johnstone, Whitworth & Co.....	11,200	
Rumsey & Greutert Co., Inc.....	22,500	
T. Littlejohn & Co.....	47,000	
Hadden & Co.....	25,000	
Various.....	18,000	4,000

NOVEMBER 30.—By the <i>Tuamotu</i> —London:		
Meyer & Brown.....	77,000	
Ed. Maurer.....	2,000	
Rumsey & Greutert Co., Inc.....	13,500	
Aldens' Successors, Ltd.....	150,000	
Arnold & Zeiss.....	80,000	
Charles T. Wilson.....	10,000	
Various.....	20,000	342,500

NOVEMBER 30. By the <i>Manchiba</i> —London:		
Ed. Maurer.....	5,500	
Johnstone, Whitworth & Co.....	9,000	
Hadden & Co.....	40,000	
Various.....	35,000	109,500

DECEMBER 1. By the <i>Kazimba</i> —Singapore:		
The B. F. Goodrich Co.....	130,000	
Henderson & Korn.....	85,000	
General Rubber Co.....	70,000	
Ed. Maurer.....	25,500	
Various.....	165,000	472,500

DECEMBER 1. By the <i>Patna</i> —London:		
Meyer & Brown.....	33,500	
Arnold & Zeiss.....	12,200	
Earle Bros.....	11,200	
Rumsey & Greutert Co., Inc.....	7,000	
Ed. Maurer.....	11,200	
Rumsey & Greutert Co., Inc.....	6,000	
Charles T. Wilson.....	35,000	
Michelin Tire Co.....	53,000	161,100

DECEMBER 7.—By the <i>Glenstrae</i> —London:		
Arnold & Zeiss.....	12,500	
Rubber Trading Co.....	4,500	
Earle Bros.....	1,500	18,500

DECEMBER 7. By the <i>St. Egbert</i> —Singapore:		
Meyer & Brown.....	4,500	
The B. F. Goodrich Co.....	140,000	
T. Littlejohn & Co.....	50,000	
Henderson & Korn.....	105,000	
Arnold & Zeiss.....	15,000	
Hadden & Co.....	11,200	
Johnstone, Whitworth & Co.....	35,000	
Ed. Boustead.....	3,500	
Various.....	350,000	830,200

DECEMBER 4. By the <i>City of Delhi</i> —Colombo:		
Rubber & Guayule Agency, Inc.....	215,000	
Meyer & Brown.....	135,000	
W. R. Grace & Co.....	50,000	
Various.....	1,300,000	1,700,000

DECEMBER 5.—By the <i>Kabingo</i> —Colombo:		
Rubber & Guayule Agency, Inc.....	100,000	
Meyer & Brown.....	45,000	
W. R. Grace & Co.....	11,200	
W. Stiles & Co.....	11,200	
Various.....	72,200	239,600

DECEMBER 9.—By the <i>Orduna</i> —Liverpool:		
Robert Badenhop.....	11,200	
Various.....	125,600	136,800

DECEMBER 14. By the <i>Feado</i> —Colombo:		
Rubber & Guayule Agency, Inc.....	105,000	
Meyer & Brown.....	80,000	
W. Stiles.....	33,500	
Johnstone, Whitworth & Co.....	2,200	
Various.....	270,000	490,700

DECEMBER 18.—By the <i>Menominee</i> —London:		
Ed. Maurer.....	27,000	
Johnstone, Whitworth & Co.....	4,500	
Arnold & Zeiss.....	9,000	
General Rubber Co.....	11,200	
Various.....	2,000	53,700

DECEMBER 21. By the <i>Minneceaska</i> —London:		
Various.....	9,000	

CUSTOM HOUSE STATISTICS.

PORT OF NEW YORK—OCTOBER, 1914.		
Imports.	Pounds.	Value.
India rubber.....	1,075,731	\$5,750,707
Balata.....	81,775	133,633
Guayule.....	28,583	22,074
Gutta percha.....	40,264	7,638
Gutta Jelutong (Pontianak).....	545,216	28,301
Total.....	13,759,502	5,948,153

Exports:		
India-rubber.....	254,656	139,972
Balata.....	166,066	72,146
Rubber scrap, imported.....	360,997	24,487
Rubber scrap, exported.....	64,176	4,186

PORT OF PORT HURON, MICHIGAN—OCTOBER, 1914.		
Imports:		
India-rubber scrap.....	12,482	2,845

PORT OF NEW YORK—NOVEMBER, 1914.		
Imports:		
India rubber.....	11,990,361	\$5,401,579
Balata.....	336,306	110,821
Gutta percha.....	73,740	12,356
Total.....	12,400,407	\$5,524,756

Exports:		
India rubber.....	754,564	411,618
Balata.....	62,740	1,464
Rubber scrap, exported.....	11,851	1,434

PORT OF PHILADELPHIA—NOVEMBER, 1914.		
Imports:		
Rubber scrap.....	29,745	\$1,278

PORT OF CHICAGO—NOVEMBER, 1914.		
Imports:		
India rubber, scrap.....	50,263	\$2,961

PORT OF SAN FRANCISCO—NOVEMBER, 1914.		
Imports:		
India rubber.....	4,400	\$2,427

PORT OF NEW ORLEANS—NOVEMBER, 1914.		
Imports:		
India rubber.....	40,855	\$21,493

PORT OF BOSTON—NOVEMBER, 1914.		
Imports:		
Gutta percha.....	4,421	\$534
India rubber.....	2,227	468

PORT OF DETROIT—NOVEMBER, 1914.		
Imports:		
India rubber, scrap.....	14,498	\$2,921
Exports:		
Rubber scrap, exported.....	796	\$52
Rubber, reclaimed, exported.....	12,699	2,480

PORT OF NIAGARA FALLS—NOVEMBER, 1914.		
Exports:		
India rubber.....	146,547	\$82,173

EXPORTS OF INDIA RUBBER AND CAUCHO FROM PARA, MANAOS AND IQUITOS DURING THE MONTH OF OCTOBER, 1914.

EXPORTERS—	NEW YORK.					EUROPE.					GRAND	
	Fine.	Medium.	Coarse.	Cauchó.	TOTAL.	Fine.	Medium.	Coarse.	Cauchó.	TOTAL.	TOTAL.	TOTAL.
Zarges, Berringer & Co., kilograms.....	116,486	13,534	88,361	15,923	234,304	145,903	19,837	36,335	13,013	215,088	449,392	
Ad. H. Alden, Ltd.....	27,370	4,760	42,130	11,311	85,571	79,069	10,746	5,332	38	86,185	171,756	
General Rubber Co. of Brazil.....	169,442	23,582	80,227	20,868	294,119	15,300	85	.....	.....	16,150	310,269	
Suarez, Hermanos & Co., Ltd.....	48,680	1,845	28,917	34,401	113,843	.....	.....	.....	.....	.....	113,843	
R. O. Ahlers & Co.—J. Marques.....	189,783	24,140	91,549	26,545	332,017	79,822	.....	30,360	2,765	112,947	444,964	
Pires, Teixeira & Co.....	27,200	1,530	17,610	.....	46,340	26,180	170	.....	.....	26,350	72,690	
Sundry exporters.....	25,427	2,653	1,044	3,805	42,929	17,680	1,260	330	17,550	36,920	79,849	
Itacoatiara, direct.....	.....	.....	.....	.....	.....	4,200	450	1,800	.....	6,450	6,450	
Manaos, direct.....	604,388	72,044	359,838	112,853	1,149,123	359,154	33,413	74,157	33,366	500,090	1,649,213	
Iquitos, direct.....	630,712	117,104	115,513	54,102	917,431	381,665	48,547	40,093	52,372	525,677	1,443,108	
Total, October, 1914.....	1,379,674	206,018	500,075	246,759	2,332,526	802,049	83,452	135,492	115,757	1,136,750	3,469,276	
Total, October, 1913.....	899,923	182,047	371,999	216,394	1,670,363	1,100,692	92,277	130,921	182,652	1,506,542	3,176,905	



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RUBBER STATISTICS FOR LONDON AND LIVERPOOL.

Gow, Wilson & STANTON, LTD., report [November, 1914]:

		Deliv- eries,	Stocks,		
			1914.	1913.	1912.
London	Imports,				
Plantation	2,787	2,300	3,681	3,732	2,530
Other kinds	1.5	194	820	782	817
Total	2,991	2,494	4,501	4,514	3,347
Liverpool					
Imports	441	577	207	424	263
Other kinds	96	292	343	1,240	606
Total	537	869	550	1,664	869
Total London and Liverpool	2,449	3,363	5,051	6,178	4,216

The following quantities represent the figures in tons of the English rubber imports and exports for the first eleven months of the last three years:

ENGLISH RUBBER STATISTICS. FIRST 11 MONTHS.

	1912.	1913.	1914.
IMPORTS.			
Plantation	19,068	28,844	34,526
Other kinds	30,192	35,608	25,157
Total	49,260	64,452	59,683
EXPORTS	33,508	41,193	43,577
(For the month of November alone.)			
Plantation	2,028	2,920	3,823
Other kinds	3,028	3,115	1,197
Total	5,056	6,035	5,020
Exports	3,551	4,352	6,269

PLANTATION AND BRAZILIAN RUBBER PRODUCTION

W. H. RICKINSON & SON report [December, 1914]:

		1914			
	F. M. S.	Straits Settlements.	Ceylon.	Rest.	Totals month on month.
January	2,542	1,181	1,333	185	5,241
February	2,364	1,703	1,459	158	5,684
March	2,418	1,285	1,309	102	5,114
April	2,151	1,548	757	66	4,522
May	2,069	1,309	819	65	4,262
June	2,306	1,460	1,070	86	4,922
July	2,971	1,584	1,156	142	5,853
August	1,850	1,325	.....	.....	4,000
September	2,903	1,602	.....	.....	5,300
October	.....	2,006	.....	.....	5,000
November	.....	.....	.....	.....	5,500
December	.....	.....	.....	.....	.....
Total	21,574	15,023	7,903	804	55,398

*Estimated.

BRAZILIAN PRODUCTION, ETC.

		1914			
	Receipts at Para.	Totals month on month.	*Para visible supply.	†World's stock. (all kinds)	†World's visible supply. (all kinds)
January	4,430	4,430	6,960	11,768	19,268
February	4,600	9,030	9,080	11,850	22,202
March	4,850	13,880	8,350	12,150	23,800
April	3,830	17,710	7,500	12,300	24,000
May	2,890	20,600	6,793	11,369	21,500
June	2,050	22,650	5,090	12,869	21,939
July	1,340	23,990	3,380	11,021	21,160
August	1,610	25,600	3,400	11,300	21,210
September	2,400	28,000	3,970	10,640	22,020
October	2,980	30,980	4,260	10,250	20,041
November	.....	.....	.....	.....	.....
December	.....	.....	.....	.....	.....
Total	30,980	.....	58,783	115,517	217,140

*And Caucho. †Estimated.

BALBUSE GUM DUTIABLE.

The Assistant Secretary of the Treasury has instructed the Collector of Customs, New York, that "Balbuse Gum" which has been imported free as crude rubber, has been washed, cleaned, dried and pressed into sheets for convenience in handling and transportation. It will be therefore be subjected to a duty of 15 per cent. under paragraph 385 of the tariff of the 3rd of October, 1913

or products not as good as
 at to be? Probably I can
 how to make them right.
 anyway.

CK J. MAYWALD, F.C.S.
 CONSULTING CHEMIST
 'Phone, 823 John New York

BUYERS' DIRECTORY 73

NOT A
"Cravenette"
 RAIN COAT

UNLESS THIS CIRCULAR
 REGISTERED TRADE-
 MARK IS STAMPED ON
 THE INSIDE.



INDIA RUBBER WORLD

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 1889



Edited by HENRY C. PEARSON—Offices, No. 25 West 45th Street, NEW YORK.

Vol. LI. No. 5.

FEBRUARY 1, 1915.

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Published on the 1st of each Month by

THE INDIA RUBBER PUBLISHING CO.

No. 25 West 45th Street, New York.

CABLE ADDRESS: IRWORLD, NEW YORK.

HENRY C. PEARSON, Editor

Vol. 51.

FEBRUARY 1, 1915.

No. 5

SUBSCRIPTIONS: \$3.00 per year, \$1.75 for six months, postpaid, for the United States and dependencies and Mexico. To the Dominion of Canada and all other countries, \$3.50 (or equivalent funds) per year, postpaid.

ADVERTISING: Rates will be made known on application.

REMITTANCES: Should always be made by bank draft or Postoffice or Express money order on New York, payable to THE INDIA RUBBER PUBLISHING COMPANY. Remittances for foreign subscriptions should be sent by International Postal Order, payable as above.

DISCONTINUANCES: Yearly orders for subscriptions and advertising are regarded as permanent, and after the first twelve months they will be discontinued only at the request of the subscriber or advertiser. Bills are rendered promptly at the beginning of each period, and thereby our patrons have due notice of continuance.

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Entered at the New York postoffice as mail matter of the second class.

TABLE OF CONTENTS ON LAST PAGE OF READING.

THE EMBARGO COMMITTEE.

THE Embargo Committee, in expressive American phraseology, "made good." From its inception the membership was full of promise. Headed by the capable and energetic president of the Rubber Club, Mr. Hodgman, an able second was found in the president of the Rubber Association. Mr. Bruyn is somewhat new in rubber, but his firm, Littlejohn & Co., for years have been factors in other Ceylon products and knew every condition in New York, London and the Far East. Then, too, Mr. Marks long ago proved himself a far-seeing and brilliant forecaster of rubber events, with a genius for action at exactly the psychological moment. Mr. Hotchkiss, although new to rubber committees, fitted into the delicate and arduous work with an ease that bespoke the natural diplomat. Nor would it be fair, in viewing the personnel of this important body, to forget the quiet, effective worker who furnished the world with the news of the committee's progress—Secretary Vorhis. The Rubber Club is to be congratulated in having the timber from which to build such an efficient committee.

THE RUBBER TRADE ON GUARD.

THE serious manner in which the rubber manufacturers have taken up the obligation to play fair with England in the matter of crude rubber is in every way admirable. The great majority not only have pledged themselves not to resell or reship rubber received under the lifted embargo, but they have gone further. The special committee which has been formed to detect and report upon any attempts at a violation even of the spirit of the agreement with Britain has not only a minute knowledge of rubber export and import conditions, but is abundantly supplied with just the sort of assistance that the circumstances require. With the reputable manufacturers and importers thus standing together and on the alert, it will be difficult for any to break the compact—if indeed there are any so disposed.

ENGLAND NEED NOT FEAR SENDING TOO MUCH RUBBER.

IF our English friends have been afraid to ship us rubber lest we get too much and yield to the temptation of re-shipment to the enemy, they can quiet their fears at once, for there is no possibility of such a contingency. We can use all the rubber that they can spare us. Last year the manufacturers of the United States consumed about 60,000 tons of crude rubber, one-half of this large volume coming from the East. In all probability the present year will see an increased consumption—provided we can get the rubber—of at least 15 per cent., or a total of about 70,000 tons. Assuming that the Eastern production reaches 70,000 tons during the current twelve months, we will doubtless be able to use one-half of it, or more.

To illustrate, there is the tire industry. There are now in operation in this country 1,600,000 motor vehicles of one sort or another, and it is a fair estimate to say that they will need between now and next January an average of six tires each, which means a consumption of nearly 10,000,000 tires. It is quite true that many people who had hoped to own a pleasure car may have to forego that ambition for another year because of general financial conditions, but as against that the motor car will be used this year more than ever before for purely utilitarian purposes. The farmer, for instance, has found that his automobile is quite as necessary as his team of horses.

Again, the demand for rubber from the footwear manufacturers will be unusually large—not that up to the

present time our winter has been marked by extreme severity, but simply because of the general cleaning up of stocks by foreign orders. Then the increase in railroad rates recently granted by the Interstate Commission has already stimulated the demand for railroad equipment, and some of the trans-continental lines are arranging new financing on a large scale to supply such equipment—which means, of course, more hose and more packing.

It can be very safely said that we not only can but will use all the rubber England can spare us, and that there will be no surplus to be attracted abroad by unusual financial offers on the part of the enemies of the Allies—even if there were any American dealers disposed under present conditions to make such sales.

A WONDERFUL CHANCE TO CLEAN UP.

ONE does not need a lively sense of credulity to believe current reports that the makers of rubber boots and shoes have been enjoying a chance without precedent to clean up. With millions of men in the field, fighting, sleeping and living in trenches in mid-winter, it is obvious that the first requisite for preserving health and maintaining fighting fitness is waterproof footwear; and it is equally obvious that the belligerent governments have been in no position to wait for their orders to follow the ordinary manufacturing routine but must take what they could get quickest. If there are manufacturers of rubber boots and heavy shoes who have not cleared out their surplus stock it would appear to be their own fault; certainly fate could not have been kinder.

Emptying the warehouse does not in the least signify the working off of damaged or inferior goods. There is no other line of manufacture on earth where it is so impossible to foretell the future demand as it is in the rubber footwear industry. Who can say in July whether the coming January will bring five feet of snow or glow with springtime balm, with pedestrians complacently going about in pumps? Both contingencies must be provided for. If the blizzards come, well and good—every rubber finds its leather sole-mate; but if the snow fails, many cases must stay in the storehouse for another season. But that means no appreciable deterioration, where the goods have quality to start with. So the soldiers of the Allies, who have depleted American surplus stocks as probably they were never depleted before, are not wearing discards, but are comfortably and serviceably shod.

This unprecedented foreign demand explains, in part

at least, why, with disappointing winter conditions at home, rubber dividends have been earned and rubber shares rule strong.

HOW WOULD IT WORK OUT?

“IMMEDIATE action by the United States Congress prohibiting absolutely the importation of British rubbers or products thereof or any kind of manufactured rubber goods into the United States.”

That was the whimsical suggestion made in all good faith in the columns of the daily press by an ardent, if injudicious, friend of the American rubber trade—in case England did not forthwith lift the obnoxious embargo.

The idea evidently was that if our English friends would not let us have what rubber we needed now, we would have none of their rubber in the future, and that it should be left to pile up in their warehouses until it decayed of old age. But how in reality would it have worked out? If a British embargo for two months proved so troublesome, what would be the effect of an American embargo declared for an indefinite period? Would restrictions emanating from Washington be any less onerous than those originating in London? If withholding needed supplies for a few weeks caused us so much distress, what would be the result of a permanent prohibition? It was declared in the midst of the embargo, by several manufacturers, that if it were continued very much longer our supply, which normally should be 60,000 tons a year, would be cut down to a paltry 35,000 tons, that workmen would be laid off in all our factories and that there would be a marked and universal increase in the cost of rubber goods. How would this unhappy situation have been relieved had Washington added its embargo to that of London?

As a matter of fact, had Congress ever attempted such a measure and rubber prices had gone up fifty or seventy-five per cent., would not the army of a million and a half tire users, to say nothing of other consumers of American rubber goods, have swept down on Congress like an avalanche, demanding the instant repeal of the rubber prohibition?

Fortunately, the situation did not call for extreme measures and the suggestion quoted above, which appeared in a number of papers, was probably never seriously entertained by our national law makers—even though they have at times shown a marked penchant for fantastic legislation.

WOULDN'T SOME PHILIPPINE RUBBER HAVE BEEN MOST CONVENIENT?

PROBABLY never before in its history has the rubber trade of America been so impressed with its absolute dependence upon foreign sources of supply as during the two months of the English embargo. With all British sources closed to us and all the other sources quite inadequate for our needs, what a relief it would have been to the situation if there had been a few hundred thousand acres of bearing rubber trees somewhere on American soil—in the Philippines, for instance! It is close to seventeen years now since Commodore Dewey remarked nonchalantly "You may fire when ready, Gridley"—and the Philippines passed under our control. What progress in rubber planting might not have been made in that time, instead of the few paltry, feeble experiments which have constituted our total rubber planting achievements in those islands.

However, it must be confessed that, with one of the great political parties evidently bent on handing the Philippines over, bag and baggage, to the head-hunting Moros at the first possible opportunity, the inducement for American capital to enter upon Philippine development has not been altogether irresistible.

WHAT RUBBER GOODS COST THE BREWER.

WHILE the article appearing on later pages of this issue on "The Uses of Rubber in the Brewery" will doubtless prove of interest as showing the multifarious purposes for which rubber is used in the brewing industry, information as to the amount annually expended by brewers for rubber goods is of more material interest. Figures courteously placed at our disposal by members of the brewing trade enable us to furnish this information, at least approximately.

Three brewers, the aggregate of whose sales for last year was 1,769,780 barrels, purchased during that period rubber goods of all kinds—hose, packing, etc.—to the value of \$74,813. During the latest year for which authentic returns are available—the fiscal year ending June 30, 1914—the brewers of the United States produced and sold 66,105,444 barrels of malt liquor.

This output is likely to be increased, at least to the extent of the greater part of the 146,549 barrels of beer imported from Austria, Germany and Belgium during the last fiscal year. This, during the continuation of the war, the home brewers will doubtless have to supply.

Assuming that in the production of this aggregate the total purchases of rubber goods were in the same

proportion to output as the figures given above—not an unreasonable hypothesis, considering that the processes and apparatus employed by brewers are essentially similar—the brewing trade expended, during the twelve months here quoted, in round figures, \$3,000,000 for rubber goods.

THE RUBBER CLUB'S ANNUAL BANQUET.

THE Rubber Club of America, since its inception as the New England Rubber Club, has enjoyed an unbroken series of mid-winter banquets. It is interesting and significant to note that in the minds of the club members the last banquet has always been the best. 1915 has proved no exception to this rule. Instead of calling the club members together and feasting sumptuously themselves, they feasted by proxy; that is, they sent money to the sufferers in the great war. The supposititious attendance at this banquet was about 20,000.

An imaginative illustration of this Sixteenth Annual Banquet appears on another page.

THE PASSING OF A PIONEER.

IN the death of J. C. Harvey, Mexico loses one who did much for the betterment of all those with whom he came in contact. His efforts to help the planters in Veracruz and Oaxaca, his plans for botanic stations on the Isthmus of Tehuantepec, his essays, journeys, counsels—all for the betterment of the Americans and English who had settled in the "hot country"—will not soon be forgotten. His frail body could not stand the energy of his eager pioneer spirit, and he has gone, but from pen to planter those who remain will long hold him in loving remembrance.

SAID A MANUFACTURER OF RUBBER GOODS WHO IS ONE OF the big buyers of crude rubber: "I do not like the word boycott, but as soon as I learn that any rubber importer or broker is sending crude rubber out of the United States I intend to drop him for good and all. I shall do this because in encouraging embargoes he is directly working against my interests. He should protect his customers, not handicap them. As far as I can learn, that is the feeling of many other manufacturers as well."

AFTER A LAPSE OF SEVERAL MONTHS WE ARE DELIGHTED to welcome again that excellent review "Le Caoutchouc & la Gutta-Percha"—back numbers and all. We trust that this means that the publication is to be continued.

In a brief note explaining the delay the publishers say: "Events having deprived us of many collaborators and workers, we have not been able to give our review its usual importance. We therefore request our friends to excuse us, as we are reorganizing rapidly to overcome this difficulty."

The Rubber Industry in France.

IT is to a Frenchman that the civilized world owes its earliest knowledge of india rubber and the peculiar properties to which its value in the arts and industries is due. In 1735 Charles Marie de la Condamine, a French military officer, visited South America for the purpose of making astronomical observations. Having concluded his work in Peru, he determined to return to the east coast by way of the Amazon River. This he did, traveling overland to the Andes Mountains and following the course of the various affluents of the Marañon and Amazon across the then unexplored continent. He returned to France in 1743, and in a paper that forms part of the history of the Royal Society of France for 1745 gives an interesting account of his travels. He refers particularly to "cauchou," the modern rubber, and describes the bottles, syringes, etc., the natives made from this remarkable substance.

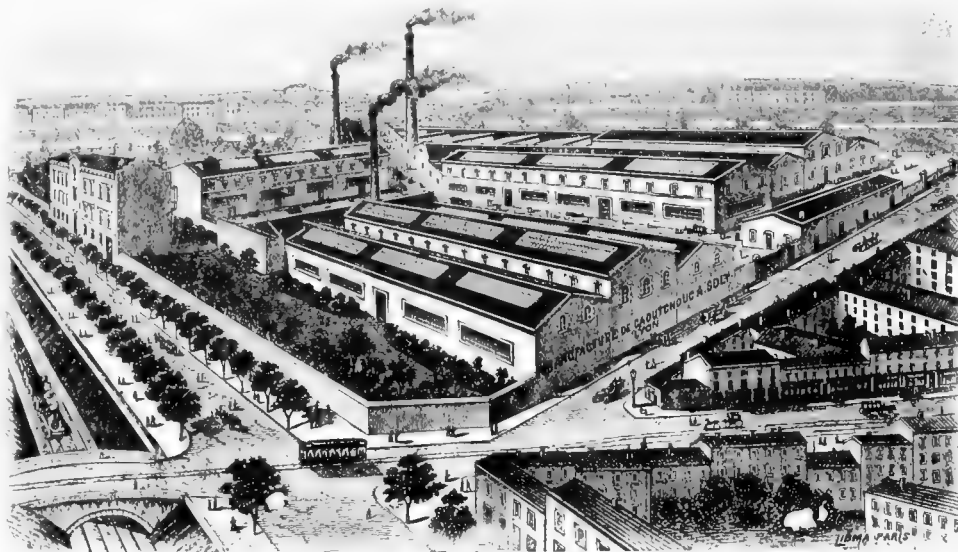
In the history of the Academy for 1751, there is published another paper by M. de la Condamine, devoted entirely to rubber, in which he gives further particulars in regard to "caoutchouc" and describes the travels and researches that led to the discovery of the trees from which the South American natives extract the gum, in the French colony of Guiana. Illustrations of the tree, its foliage and fruit and of the method of tapping it, accompany this paper.

While thus, from the scientific standpoint, a leading place in the history of the rubber industry belongs to France, the name "caoutchouc" being in itself a reminder of the fact, the growth of the rubber manufacturing industry in that country has been slow compared with its progress in other lands. This may be in part ascribed to the tendency of the French manufacturers to specialize in certain lines, thereby neglecting or losing sight of opportunities offered in other fields. Small articles, such as toys, tobacco pouches, articles of female apparel, elastics, etc., have largely occupied the attention of the French manufacturers, whose pre-eminence in their production is reflected in the character of their exports. For the more serious lines of mechanical rubber goods, the army and navy and the great railroad corporations have been the largest customers, private buyers, such as manufacturers and others, preferring the products of foreign countries, notably of Germany and England. The production of hard rubber articles, on the other hand, has been brought to a high degree of perfection in France, Paris carrying on this business extensively, especially in connection with scientific and surgical instruments, mouthpieces for pipes, toilet goods, etc.

The manufacture of crude rubber affords a practical criterion

as to the growth of the French rubber manufacturing industry. In 1836, France imported 72,000 pounds of crude rubber, in 1862 the quantity entered had increased to 1,800,000 pounds, in 1870 it was 2,500,000 pounds, and in 1890 upwards of 4,000,000 pounds. In the year 1900 the imports of crude rubber were 6,285,314 pounds, and while some of this was re-exported in an unmanufactured state it was for the greater part used in French factories.

The manufacture of rubber goods was established in France as an industry in 1828, the Michelin rubber-goods factory at Clermont - Ferrand, dating from that year, being the oldest in that country. This concern was also a pioneer in the manufacture in France of rubber tires and rubber goods for flying machines. For the reason above stated and because there was less call for rubber goods in



A TYPICAL FRENCH FACTORY.

France than in many other countries, the progress of the industry has been gradual, and it has never attained the same importance as in England and Germany.

An important factor in the encouragement of the rubber manufacturing industry in France was the prominence given to rubber at the great exhibition held in London in 1851. The exhibit of Charles Goodyear, who had shortly before perfected his process of vulcanizing rubber, consisting of household furniture, decorative objects, jewelry, culinary and household utensils, toilet articles, clothing, footwear, etc., attracted wide attention and served to show the infinite variety of purposes for which rubber could be used. The accompanying illustration shows the Goodyear exhibit at the following international exposition, held in Paris in 1854, which was similar to the first in character and comprehensiveness.

One of the lines that early engaged the attention of the French manufacturer was that of rubber boots and shoes. In some parts of France—Brittany for instance—the prevalence of rainy weather led to a steadily increasing demand for rubber footwear and waterproofs. To supply a deficit, rubber boots and shoes were imported and the American article, owing to its superior fit, style and wearing properties, speedily won the favor of buyers. This resulted in a growing importation of the American product which finally attracted the attention of Hiram Hutchinson, who, having established a small rubber manufacturing plant at New Brunswick, New Jersey, subsequently took part in the formation of the Newark Rubber Co. He visited France to arrange for the purchase and exploitation of the Goodyear vulcanization patents on the continent. In 1853, while in Paris, he prospected for an eligible site for a rubber-goods factory and finally decided on a place about three hours' journey from the capital, now known as Langlée in Châlette, near Mon-

targis. The availability of a water-power right and the fact that nearby communities promised plenty of labor were factors in the selection of the site. Here was located the beginning of one of the most important rubber manufacturing enterprises in France, where, in addition to rubber footwear of world-famous excellence, rubber tires and an endless line of rubber goods of every description are made.

In 1869 Hiram Hutchinson, the founder, died, but the concern had already been incorporated and Alcazar Hutchinson, his oldest son, succeeded him. In 1872 Mr. H. P. Moorhouse went over from the United States and reorganized the concern, which assumed the present title of A. Hutchinson & Co. With the decease of Mr. A. Hutchinson, about 1889, the last of the members bearing the name had passed from the firm, and in 1898 Mr. J. Kennedy Smyth, who had been associated with Mr. Hutchinson in the foundation of the enterprise, died. He is believed to have been the last of the original subscribers to the successful concern, which is now conducted as a corporation, with a capital of \$650,000.

French rubber goods factories have steadily increased in productive capacity, due to completeness of equipment, rather than in size or number, the latter part of the nineteenth century witnessing the most important development in the industry, which had reached a highly prosperous condition as early as 1875. In 1863 the Syndicat Professionnel of the india rubber, gutta percha, oil cloth and imitation leather industries was founded, marking quite an important epoch in the rubber trade. Partaking of the nature of a guild, it takes cognizance of customs and freight tariffs, industrial legislation and all matters affecting the interests of the trades it represents. About this time, too, a tendency to generalize in the manufacture of rubber goods developed; the compounding of rubber with other substances and the use of reclaimed rubber and rubber substitutes became more common. This necessitated changes in the machinery and equipment, and while making these alterations manufacturers installed necessary apparatus for extending the scope of their operations and the variety of their productions.

The period immediately preceding the commencement of the war probably witnessed the greatest prosperity in the history of the French india rubber interest. The growth of the automobile industry had lent a notable impulse to the business of manufacturing rubber tires, almost if not quite sufficient to counter-balance the depression that had existed in the mechanical and surgical rubber goods branches; and the year 1914, but for the demoralization of business due to the outbreak of hostilities, would have ended as one of the best the French rubber industry has ever seen. During the past year tires of every description have occupied a conspicuous place in French rubber manufacture. The large and increasing demand from the home market and the facility with which an export trade could be established, has induced many French manufacturers to add tires to their regular output and there has consequently been a large increase in the

number of tire manufacturers in France. Statistics for 1913 show the value of tires exported to have been about \$18,000,000. Figures available for the months of 1914 prior to the war are uncertain, but the incomplete figures published relating to the first half of 1914 show an increase, as compared with the same period of the preceding year.

With the opening of the year 1914 France had at least 20 prominent tire works, but few of these were known outside the country. The few, however, that enjoyed international fame ranked with the foremost companies in existence and were selling their tires all over the world, wherever there are motor cars. The present war between France and Germany was preceded by a fierce commercial struggle between leading German tire manufacturers and prominent French firms. It began with a price policy controversy and terminated in a boycott instituted simultaneously by both sides. The trouble was in part carried into English territory and for a time caused serious trouble in the British tire trade.

At present, the manufacture of tires appears to absorb the greater part of the producing energy of the French rubber industry. The latest French rubber trade directory shows 110 companies, large and small, engaged in the manufacture of rubber tires and hose. Not all are strictly French, some being foreign houses having manufacturing branches in France, and some of the companies referred to as tire manufacturers make them only as a side line. The comparison of this figure with that for other branches of the industry is interesting. There are, for instance, 19 companies manufacturing rubber balls, 3 making tobacco pouches, 40 garters, suspenders, etc., 10 making dress shields, 1 making rubber sheets for copying presses, and 4 making rubber thread. Nearly 30 firms make waterproof cloth and 8 are making rubber footwear. It will be seen that with the exception of mechanical goods, French firms manufacture all lines. There has nevertheless been a large demand for foreign goods which has been met by Germany and England.

From the first named country the imports have amounted to \$4,000,000 a year, so that France has been a good customer of the German rubber industry, while Germany's purchases of rubber goods from France amounted only to about \$1,000,000, mostly

for tires. French manufacturers have made but little systematic effort to introduce their goods, with the exception of tires, into foreign markets. The business that has come to them has been chiefly of a fortuitous character, no French rubber goods manufacturer, outside of a few large firms, having made any attempt to maintain systematic foreign representation. French rubber goods have found only a few years in the past a market in the United States



GOODYEAR'S VULCANITE COURT

and Egypt, but of late these markets have been vigorously contested by Germany, Austria and England, and in one of the most favored of French goods, rubber shoes, Russia has become a keen competitor.

Imports of rubber goods by France include rubber thread, the annual value, normally, of about \$1,000,000, and elastic cloth,

materials to about half this amount. Dress shields are imported to the number of 100,000; garters, suspenders and hose supporters to the value of about \$30,000, and cloth material to the

and are thus able to get in touch with foreign buyers visiting the city, or can readily reach export houses serving the French trade and conducting business especially with South America,

Russia, and what is known as the near-East, meaning the Balkans, Asia Minor and Egypt.

While we may estimate the number of leading firms acting as importers, exporters, wholesale or large retail distributors of manufactured rubber goods in France as from 150 to 200, it is possible that the actual number is much larger and it is difficult to draw the line in such an estimate. There are altogether in France about 50 large firms importing raw rubber, about six being located in Havre and an equal number in Bordeaux. All have branches in Paris, Roubaix, Marseilles and a few other places where markets for crude rubber are desirable.

France, in 1913, imported foreign crude rubber to the value of \$40,345,100 and retains annually a considerable portion of the rubber coming from her own possessions. The exact value of the exports for 1913 is quoted as \$24,405,000, so that about \$16,000,000 worth of rubber was retained for home manufacturing purposes. Imports and exports of crude rubber fell off somewhat during 1914, and figures for the period since the war began have not been made public. For the first eight months of 1914, the French imports of unmanufactured rubber amounted to 29,932,744 pounds, compared with 31,922,736 pounds for the same months the year before.

Havre and Bordeaux are the leading ports of entry for rub-



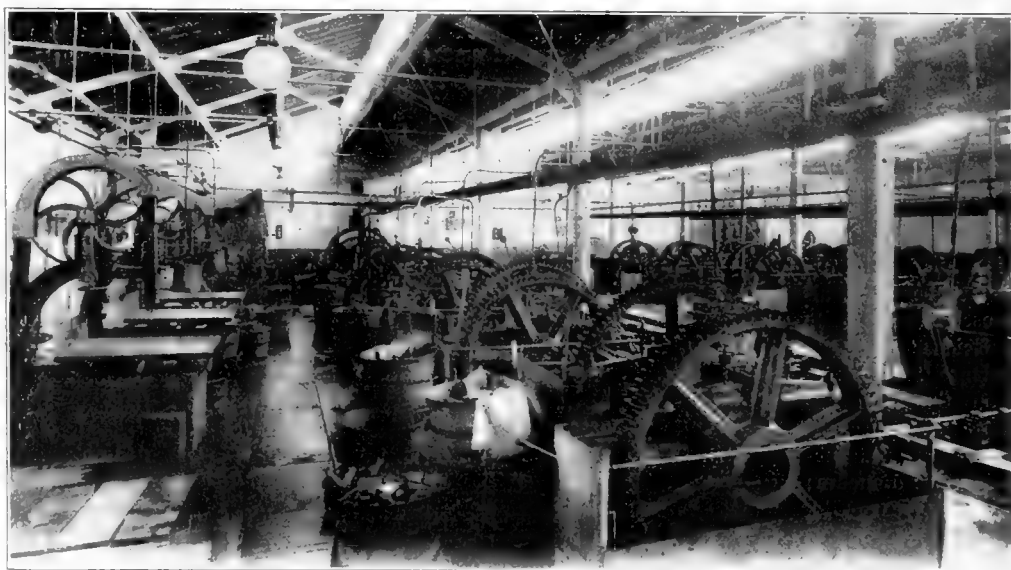
From Gaul's Tire Corporation, New York.

NOON AT A FRENCH FACTORY

value of \$150,000. Rubber boots constitute an important item in the list of imports, amounting in value to \$200,000. The exports of rubber footwear from the United States to France has reached a total annual value of \$23,667. Tires and hose, constituting the most important item in the French imports of manufactured rubber goods, amounted last year to about \$5,000,000 in value; for the year ending June 30, 1914, the United States sent automobile tires valued at \$5,448 to France and other kinds of rubber tires to the value of \$15,284. Goods manufactured from rubber and other materials, such as belting, hose, packings, etc., were imported by France last year to the value of about \$2,400,000, articles of this class to the value of \$62,319 being supplied by the United States. As against these imports there has been developed a very considerable export trade in a number of lines. The value of the exports of elastic materials, for instance, is about \$6,000,000 a year. Proofed garments are exported to the value of nearly \$2,000,000 and \$100,000 worth of rubber boots are sold abroad. Tires, hose and similar materials to the value of about \$18,000,000 are sent to foreign markets, leaving a tire balance of \$13,000,000 in favor of France, while belting, etc., exported reaches a value of about \$3,000,000.

The depressed condition that prevailed in most of the European markets during the first part of 1914 was not without its effect on the French imports of rubber goods and, to judge from the meagre material at hand, there has been a decrease in most of the import lines. Since the commencement of hostilities there have been, of course, no exports but, all things considered, the industry had done well up to the end of July and had at least kept up the average of the preceding year, the decrease on one side being balanced by an increase on the other.

Paris is the chief seat of French export trade. Most of the leading manufacturers have some form of representation there,



INTERIOR OF A FRENCH FACTORY.

ber in France, Havre taking precedence as regards Para rubber. Of the total imports of rubber by way of that port in 1913, 7,146,839 pounds were Para rubber and 2,495,346 pounds came from the French Congo. The following table gives the imports at Havre in pounds since 1898:

1898.....	5,374,814	1904.....	4,823,664	1909.....	8,335,592
1899.....	4,091,737	1905.....	7,253,338	1910.....	9,828,106
1900.....	5,180,810	1906.....	9,652,603	1911.....	8,836,036
1901.....	4,940,508	1907.....	9,841,334	1912.....	12,350,169
1902.....	4,294,560	1908.....	7,711,690	1913.....	9,859,459
1903.....	4,104,965				

Although Bordeaux does not make quite such a good showing, a considerable quantity of French colonial rubber has found entry through this port, as will be evident from the following figures:

1899.....	387,104	1904.....	2,617,087	1909.....	4,381,693
1900.....	527,972	1905.....	2,493,562	1910.....	5,128,781
1901.....	517,018	1906.....	3,510,944	1911.....	4,041,787
1902.....	1,499,808	1907.....	3,343,099	1912.....	3,009,081
1903.....	2,543,719	1908.....	2,377,264	1913.....	2,014,888

France is fortunate in having her own rubber producing territories and is thus, to a considerable extent, independent of outside sources. This places the French industry beyond the danger of lack of raw material and the military authorities will always be able to draw on the large supplies available in the French colonies. Those in which rubber is produced include Cochin China, the French Congo and other French possessions in Africa and Madagascar, which is a French protectorate, and French Guiana. The extent of the rubber producing capacity of these possessions was admirably set forth at the last rubber exhibition in London.

In French Equatorial Africa, wild rubber only is produced. By the careful protection of the rubber producing plants, the output has been largely increased within the past few years, the laws governing the exploitation of the forests being successfully enforced. The fact that the exports increased from 546 tons, with a value of \$400,000 in 1896, to 1,901 tons, of a value of \$3,400,000 in 1912, being evidence of the improvement in quality as well as quantity during the period in question.

The rubber-growing industry in Indo-China is now nearly 20 years old. The colony produces, from native plants, an excellent grade of wild rubber, but by adulterating it with inferior latex the collectors injured its reputation. Rubber planting is now well established on the southern portion of the territory, and good progress is being made by the plantations. *Hevea* has given excellent results, as also have some plants of the *Manihot* class, but *Manihot Glaziovii* and *Castilloa Elastica*, which were tried among others, were given up. In 1911 the exports of raw rubber amounted to 245 tons.

There is also a flourishing raw-rubber industry in Madagascar, the exports, valued at \$400,000 in 1902, having increased to \$1,800,000 in 1910. Recognizing that this rate of increase threatened the exhaustion of the source of supply, the government passed laws controlling collectors and restricting collection, which resulted in a drop in exports to 800 tons in 1911, with a value of only \$1,100,000. At the same time, by educating the natives in the art of collecting without sacrificing the producing plant, the industry was placed on a permanent footing.

From French Occidental Africa, 3,669 tons of rubber were exported in 1913, mostly in the form of plaques or sheets.

In addition to the trade in crude rubber, there is quite a large business in waste or scrap rubber, in the collection and distribution of which about 25 firms are engaged. It is obtained partly in France and partly from abroad, goes to reclaimers at home or in other countries, and is ultimately employed in the manufacture of the cheaper grade of goods. From Germany and the United States French manufacturers have learned the use of reclaimed rubber in the production of low quality goods and American reclaimers find plenty of trade among French manufacturers.

Finally, in the manufacture of chemicals and other ingredients used in compounding rubber a number of firms are engaged and a smaller number make a specialty of rubber manufacturing machinery. French manufacturers are also liberal purchasers of these supplies from German manufacturers and sell the latter some of their specialties; and while this trade is at present interrupted, it will doubtless be revived when the differences between the two nations have been settled.

The advantages of organization for the advancement of mutual commercial and industrial interests have always appealed to the French and rubber manufacturers and allied interests have

not been slow in profiting by them. Various societies are in existence for the promotion of the rubber manufacturing industry, among which may be mentioned the Association Caoutchoutière Coloniale, Chambre Syndicale des Fabricants de Caoutchouc et Gutta Percha, Chambre Syndicale d'Instruments de Chirurgie, Chambre Syndicale des Fournitures pour Usines, Chambre Syndicale des Fabricants de Linoleums et Toiles Cirées, Chambre Syndicale de Pneumatiques, Chambre Syndicale de Tissus Elastiques, Bretelles, etc., and the Chambre Syndicale de Vêtements en Caoutchouc et Sportif.

The value of exports of manufactures of india rubber, from the United States to France, for the past five fiscal years, ending June 30, 1914, has been as follows:

	1910.	1911.	1912.	1913.	1914.
Scrap and off.....	\$30,367	\$105,172	\$119,348	\$161,070	\$25,567
Reclaimed.....	41,500	56,413	50,444	29,525	47,737
Belting, Hose and Packing.....	1,641	3,319	27,448	32,116	62,319
Boots.....				118	1,088
Shoes.....	28,067	75,985	38,779	27,436	25,579
Tires for Automobiles.....		185,473	316,629	20,205	5,448
All other Tires.....		8,538	13,947	2,626	15,784
All other manufactures of.....	168,718	118,773	159,408	140,077	74,759
	\$290,283	\$553,572	\$726,003	\$413,173	\$322,281

THE WAR'S INFLUENCE ON RUBBER PLANTING.

Discussing rubber prospects at the recent annual meeting, held in London, of the Rubber Share Trust and Finance Co., the chairman, Mr. A. A. Baumann, expressed himself optimistically as to the future of the rubber industry. He said he expected to see rubber producers reduce their costs to about 9d. per pound, which would leave a good margin of profit on growing and make rubber shares a very profitable investment. He stated that a company of which he was chairman had reduced its costs of production to 11d. per pound, with only two-thirds of its area in bearing. He admitted that the increase in production had been attended by a reduction of consumption in some quarters. Allowing that the production of plantation rubber for 1915 would be 85,000, this would be an increase on 1914 of 20,000 tons. Of the 20,000 tons of crude rubber which Germany consumed per year, about 10,000 pounds came from the Far East plantations. As a factor against this surplus of production over consumption, would be the increased demand owing to the war; rubber boots being required for the Russians, rubber sheets and garments for the combatants of other nations and by all tires in enormous quantities. In the meantime, he pointed out that supplies from Brazil and Africa are diminishing and that countries that had formerly obtained their rubber from those sources were drawing, to an increased extent, on British plantation growers. He suggested that a possible excess of supply over demand be met by storing the surplus against a period of shortage and thus providing for a future regulation of the market, which, he urged, was quite feasible, as rubber does not deteriorate by keeping.

RUBBER ON SEIZED VESSELS.

Among the articles seized by the British authorities as contraband of war may be mentioned 222 packages of raw rubber, valued at \$21,414, forming part of the cargo of the Norwegian steamer "Sigrun," bound from New York to Malmo and Gottenburg, Sweden, and taken into Newport, England, by a British cruiser; 200 cases of crude rubber from the cargo of the "Saudedjord," a Norwegian vessel bound from New York to Copenhagen, Denmark, that was taken into Halifax, Nova Scotia, and all the rubber in the cargo of the "Virginia," a Danish vessel bound out from New York and compelled to discharge the rubber in her cargo at Newcastle, England, on suspicion that it was intended for an enemy of Great Britain. In other instances, the vessels detained were allowed to retain the rubber in their cargoes, it being evidently not intended for use inimical to Great Britain.

The Rubber Embargo Lifted, Conditionally.

NOT in many years, in fact it might be said never before in the history of the American rubber industry, has it been confronted with so serious a situation as that which existed during the weeks of the British embargo on plantation rubber. It was a situation fraught with tremendous possibilities of hardship and distress for the entire American rubber trade. There have been attempts in former years to corner the crude rubber supply but never of a character to prove menacing to the trade, but here was a practical corner which had behind it the resources of the whole British Empire, and its operation and effectiveness depended not on the ability of any man or set of men to maintain it but upon the will of the British Government. It is not to be wondered at, therefore, that the leaders of the American rubber manufacturing and importing trade bestirred themselves early to discover some speedy means of relief.

When the war broke out, on the 30th of July, there was at once created a condition of uncertainty as to rubber supplies from foreign parts, and prices rose with great rapidity during the first few days of August; but when it became clear that the Allies would have practical control of the seas and that supplies would not be shut off through the activity of Germany and Austria, prices immediately resumed their normal level. Late in October, however, England declared an embargo on shipments of all rubber from British colonial ports to any port outside of England. This in itself did not threaten serious trouble to the American manufacturer, but when, following close upon this localized embargo, came rumors of a general embargo against exportation of rubber not only from British colonial ports, but from any English port, conditions were immediately changed.

The Rubber Club of America and the Rubber Trade Association of New York did not wait for official confirmation of this general embargo rumor, but began to take steps at once to insure for the American trade its necessary supply of rubber. On November 2 a joint Embargo Committee was appointed by these two organizations, composed of George B. Hodgman, president of the Hodgman Rubber Co. and also president of the Rubber Club of America; William E. Bruyn, of L. Littlejohn & Co., president of the Rubber Trade Association of New York; Arthur H. Marks, of The B. F. Goodrich Co., and H. Stuart Hotchkiss, of the General Rubber Co. and also representing the United States Rubber Co. When, on November 13, the embargo on rubber shipments from London was officially proclaimed, the Embargo Committee began action at once to relieve the situation. Its members visited Washington and had many sessions with the State Department, but were not able to make much progress in this direction. It was discovered that greater headway could be made by taking the matter up directly with the British Ambassador, Sir Cecil Spring-Rice. They found the Ambassador not only willing but anxious to assist them. They had eager coadjutors also in the Rubber Growers' Association and Rubber Trade Association of London, the latter association also appointing an Embargo Committee, consisting of the following members: Arthur Meyer, of Arthur Meyer & Co., Limited; Edmund Stevenson, of Aldens' Successors, Limited; Andrew Devitt, of Lewis & Peat, vice chairman of the Rubber Trade Association of London, and Charles Bower, of Edward Till & Co. The interests of the members of these associations lay, naturally, in the direction of maintaining normal crude rubber relations with the United States. But despite the efforts of the committees on both sides of the water it was impossible to report real progress during the uncertain, not to say anxious, weeks of November and December.

Some members of the trade affected to believe that the embargo would be of short duration, that England was simply stocking up. But others realized that unless England could have

positive assurance that no rubber exported from London to American ports would ever find its way back in any form to her enemies the embargo would continue indefinitely. And it was generally agreed that England was absolutely within her rights in this matter, for it was obviously essential for her to deprive Germany of all supplies. To be sure this meant distress and possibly ruin to British planters in the East, but distress and ruin are the incidents of war and in this case would weigh but little in the mind of the English statesmen, realizing as they did that this was a war in which the prestige, if not indeed the very life of the British Empire, was at stake.

In addition to the work of the two committees, one in New York and the other in London, the larger rubber interests on both sides of the water were exerting every possible influence they could bring to bear for the relief of the situation. The Embargo Committee of the two American organizations not only did excellent work in presenting the situation so clearly and persistently to the British Ambassador, and through him to his government, but it performed a notable service in keeping the members of the Rubber Club informed of every step that was being taken, and also in interesting the whole American public in the matter by frequent letters through its secretary to the daily press. In the meantime it was drawing up tentative drafts of such guarantees as the members of the American rubber trade were willing to give the British Government.

Finally, late in December, the committee believed that the best and quickest way to bring the matter to a satisfactory conclusion would be to send a suitable representative to London to confer with the rubber men of that city, and with the officials of the Government; and Mr. Bertram G. Work, president of The B. F. Goodrich Co., was selected for this extremely important mission. He sailed on the "Lusitania," which left New York on December 30. Mr. Frank A. Seiberling, president of the Goodyear Tire & Rubber Co., also sailed on the same ship, going unofficially and simply in his personal capacity as one of the leading American rubber manufacturers.

Meanwhile a tentative plan had been formulated in London which enabled Mr. Work so to expedite matters that on January 8 he was able to cable the Embargo Committee of the Rubber Club that the British Government would permit exports of rubber from London to the United States under certain guarantees, the tenor of which he also cabled. This same information was furnished to the public on the same date by the British Ambassador, who gave the following statement to the press:

"Arrangements have been practically completed whereby dealers and manufacturers in the United States can obtain supplies of rubber from the British Empire.

"Manufacturers wishing to obtain large shipments will be required to give a bond through their agent in London.

"In other cases shipments will be allowed to approved manufacturers and dealers who signify their willingness to sign appropriate guarantees. Shipments will be addressed to a bank in New York, which will not deliver the rubber until the purchaser has signed and deposited guarantees with his majesty's Consul General at New York and he sanctions delivery."

The statement also contained, briefly, the details of the guarantee which manufacturers and importers would be called upon to sign.

It was first stated that the larger American manufacturers would be able to have crude rubber shipped direct to them on the filing of a bond by accredited agents in London, but it was evidently thought that this would lead to many complications and might, in fact, be somewhat prejudicial to the smaller manufacturers and importers, for the official guarantee forms as brought over by Mr. Work on his arrival on the "Lusitania,"

January 23, omit all reference to the necessity of giving bonds in London and place all manufacturers and importers on the same footing. These official forms are printed below, form No. 1 being that which the manufacturer is called upon to sign

and form No. 2 being the importer's guarantee, which bears on the back the additional guarantee of the purchaser of the rubber from the importer. These forms are so clear in their wording that they require practically no comment. They are as follows:

THE MANUFACTURER'S GUARANTEE.

FORM No. 1.

RUBBER GUARANTEE.

RUBBER.

His Britannic Majesty's Consul-General,
New York.

Packages
Weight
Quality
Marks
Ex s s.

In consideration of your consenting to the delivery to us of the rubber specified in the margin, we,

hereby give you the following undertaking, which shall remain in force so long as Great Britain is at war with any European Power.

We will not export from the United States any raw rubber, reclaimed rubber, or waste rubber, whether the same has been imported from the British Dominions or not, otherwise than to the United Kingdom or to a British Possession.

We will not sell the rubber now delivered by you to any dealer or other person or persons in the United States, but will use it for our own manufacturing purposes.

All orders received by us for manufactured or partly manufactured rubber goods to be sent to neutral European countries shall be executed from stocks maintained by us in the United Kingdom or be executed by shipments to the United Kingdom and reshipment from there under licence to be obtained for export therefrom.

We will not execute any orders for manufactured or partly manufactured rubber goods to be sent either directly or indirectly to any country or State at war with Great Britain.

We will not sell any manufactured or partly manufactured rubber goods to any person in the United States without satisfying ourselves that there is no intention on his part to export or resell the same for exportation to any countries in Europe other than Great Britain, France, or Russia, otherwise than by shipping to the United Kingdom and reshipping from there, under licence to be obtained for export therefrom.

If we export any manufactured or partly manufactured rubber goods to a destination outside Europe not being in a British Possession, we will, prior to or simultaneously with the shipment, give you particulars of the goods so shipped and their destination.

All rubber tyres exported by us or sold by us for export shall bear a distinctive name or mark, which we will communicate to you, so as to identify them as being our manufacture.

Date.....

[163-1]

THE IMPORTER'S GUARANTEE.

FORM No. 2.

RUBBER GUARANTEE.

RUBBER.

His Britannic Majesty's Consul-General,
New York.

Ex s s
Packages
Weight
Quality
Marks

I beg to inform you that I have sold the rubber specified in the margin to whose guarantee you will find on the back hereof. I will produce to you at any time on demand the original contracts or other documents evidencing the sale.

In consideration of your consenting to the delivery to them of the said rubber, I undertake that I will not, directly or indirectly, at any time so long as the present war continues, export any raw rubber, reclaimed rubber, or waste rubber from the United States, except to the British Dominions, and that I will not sell any raw rubber, reclaimed rubber, or waste rubber for exportation without satisfying myself that it is not intended for exportation from the United States, except to the British Dominions.

Date.....

[163-2]

GUARANTEE OF PURCHASER FROM THE IMPORTER.

His Britannic Majesty's Consul-General,
New York.

In consideration of your consenting to the delivery to us of the rubber specified on page 1 which we have purchased from we

hereby give you the following undertaking, which shall remain in force so long as Great Britain is at war with any European Power:—

We will not export from the United States any raw rubber, reclaimed rubber, or waste rubber, whether the same has been imported from the British Dominions or not, otherwise than to the United Kingdom or to a British Possession.

We will not sell the rubber now delivered by you to any dealer or other person or person in the United States, but will use it for our own manufacturing purposes.

All orders received by us for manufactured or partly manufactured rubber goods to be sent to neutral European countries shall be executed from stocks maintained by us in the United Kingdom, or be executed by shipments to the United Kingdom and reshipment from there, under licence to be obtained for export therefrom.

We will not execute any orders for manufactured or partly manufactured rubber goods to be sent, either directly or indirectly, to any country or State at war with Great Britain.

We will not sell any manufactured or partly manufactured rubber goods to any person in the United States without satisfying ourselves that there is no intention on his part to export, or resell the same for exportation, to any countries in Europe other than Great Britain, France, or Russia, otherwise than by shipping to the United Kingdom and reshipping from there, under licence to be obtained for export therefrom.

If we export any manufactured or partly manufactured rubber goods to a destination outside Europe not being in a British Possession, we will, prior to or simultaneously with the shipment, give you particulars of the goods so shipped and their destination.

All rubber tyres exported by us or sold by us for export shall bear a distinctive name or mark, which we will communicate to you, so as to identify them as being our manufacture.

Date.....

Two facts will be noted in connection with these guarantees. One is that all this rubber is shipped direct to the British Consul General in New York, who alone has authority to release it. The second interesting fact, as shown in the manufacturer's guarantee, is the obligation the manufacturer, the moment he buys any rubber from London, puts himself under regarding not only that particular rubber but all the rubber, whether manufactured or unmanufactured, that he may have on hand and may dispose of during the continuance of the war.

It is stated that a commission is to be appointed in London, consisting of three men not connected with the rubber trade, who shall regulate the operation of London shipments. It has been stated in the press that this commission is to consist of Lord Balfour, Russell Rea and Henry Birchenough, but this statement has not been officially confirmed.

There may be a few members of the American rubber trade who will look upon the stipulations of the required guarantees as rather harsh, but the general opinion is that the British Government has done all that could be expected of it under the circumstances. Mr. Hodgman, of the Embargo Committee, is quoted in a recent issue of the "New York Sun" as follows:

"We have no fault to find with any of the stipulations in the British announcement. We are willing to give whatever bonds are required by the British authorities, and further, we are determined to see to it that no other dealers violate the conditions. We want the rubber for the manufacturers in this country. The local trade this year will be very large and there need be no fear that the legitimate rubber trade of the country will think of doing anything contrary to the express conditions of the British announcement."

Mr. Hodgman, in this interview, undoubtedly expressed the general consensus of opinion.

The first rubber shipped from London under this conditional suspension of embargo consisted of 200 tons, which arrived on the "Lusitania" January 23. It was expected that the "Menominee," with 1,500 tons on board, and the "Minneapolis," with 1,000 tons, would sail during the last week of January, but both of these boats have been temporarily detained at London by the dockmen's strike. It is believed, however, that they will very soon be released.

The outlook for the American rubber trade is most encouraging. The plantation product for the current year should amount to 80,000 tons. In 1913 the Allies—England, France and Russia—only consumed 38,000 tons. To be sure, with the gigantic operations now going on in the field, there will probably be a larger consumption of rubber on the part of these three countries, notwithstanding the great falling off in many of the ordinary uses of rubber in times of peace. But it is hardly probable that the Allies would need over half, or much more than half, of the plantation yield—which would leave, let us say, 40,000 tons for American consumption during 1915; and this, with the South American supplies, will undoubtedly be ample.

There is just one other point that may be mentioned, namely, that the suspension of embargo is only during good behavior, and if the British Government should discover any London-shipped rubber making its way, either unmanufactured or manufactured, to the enemy, the embargo would be put in force again instantly. Undoubtedly during November and December some

rubber, both in the crude and manufactured state, found its way from American ports to Germany. It was smuggled out of the country under false manifests—not, it need hardly be said, by any responsible and recognized member of the trade. The fact that some rubber shipments have been made from United States ports to German purchasers is generally conceded. But the Rubber Club of America and the Rubber Trade Association have determined to spare no efforts to assist the State Department and the Treasury Department in preventing any such shipments in the future, and it is exceedingly improbable that any further rubber exports in any form will be made from this country to the enemies of the Allies.

MEETINGS OF THE MOTOR AND ACCESSORY MANUFACTURERS.

The twelfth annual meeting of the Motor & Accessory Manufacturers was held in New York at the Waldorf-Astoria, January 6, when, in addition to the transaction of other business, directors were elected to succeed those whose terms had expired. E. H. Broadwell, of the Fisk Rubber Co., Chicopee Falls, Massachusetts, was among those elected for a three-year term. H. T. Dunn, of the same company, declared himself unable to accept re-election. The meeting was followed by a banquet.

A meeting of the board of directors was held on January 7, when the following officers were elected for a term of one year: President, F. H. Lovell, Jr., of the Lovell-McConnell Manufacturing Co., Newark, New Jersey; first vice-president, C. W. Stiger, of the Stromberg Motor Devices Co., Chicago; second vice-president, C. E. Thompson, of The Electric Welding Products Co., Cleveland, Ohio; third vice-president, T. J. Wetzel, of The Dyneto Electric Co., New York; treasurer, L. M. Wainwright, of The Diamond Chain & Manufacturing Co., Indianapolis; assistant treasurer and secretary, A. P. Sloan, Jr., of the Hyatt Roller Bearing Co., Newark, New Jersey.

REPORT OF GUAYULE GROWING BY AKRON SYNDICATE NOT CONFIRMED.

Statements have frequently appeared in the daily press to the effect that an Akron syndicate has made a twelve-year contract with certain large ranch owners near Marathon, Texas, for the right to grow guayule shrub upon their properties and that this shrub is intended to be shipped to Akron for manufacture into crude rubber. The area thus leased is given as several million acres. Inquiries fail to verify report of organization or to identify capitalists described, Akron rubber men regarding the story as part of the publicity program of the land company's promotion scheme.

Work has been commenced on a new factory for the Toledo Ford Tire Co. at Findlay, Ohio. The plans have been drawn to permit of additions to the plant as they become necessary.

At the meeting of the Detroit section of the Society of Chemical Industry, held December 18, James H. Bogart read a paper on "The Manufacture of Insulated Wire."

Rubber in the Brewery.

By C. E. Bevington.

WHILE there are few industries in which, for one purpose or another, rubber is not used, it would perhaps be difficult to select one in which it is employed for so many uses and is so truly indispensable, as in the brewery.

Dealing at almost every step in the production of beer with fluids, in liquid or gaseous form, the brewer is constantly dependent on rubber for the means of transporting or confining them, while the condition of moisture in which he constantly works makes rubber an indispensable element in much of his apparatus. For the most part, the rubber goods used in breweries are of the sturdy class, strong and substantial, to withstand the by no means gentle usage they are liable to meet with from the heavy-handed brewery workmen; and the proprietors are, in consequence, keenly alive to the necessity for high-grade material and plenty of it, and reliable workmanship, in purchasing this class of supplies.

Although there is no lack of rubber goods manufacturers who, catering constantly to the trade, are familiar with the uses to which rubber is put in the brewery and know just what the brewer wants in this line and what he wants it for, there are others to whom the purposes for which rubber is used in the brewing industry are not as familiar, and these may find it worth while to take an imaginary trip through a big modern brewery, with its attendant bottling works, in the course of which they may learn of uses in this connection of which they were previously unaware.

Right at the entrance we note a big hopper, into which a gang of men are busily dumping the contents of sacks arriving in a succession



RUBBER ELEVATOR BELT.

of wagons. This is malt, the body of beer, which is raised into big bins, on an upper floor, whence it descends through the different departments in the course of its transformation into beer. We note at once that the belt of the big elevator is of rubber, the material that best resists the heavy wear and the dust-laden atmosphere in which it works, and which is least liable to generate and conduct electricity. This is, important, as a spark in the atmosphere, loaded with fine, dry dust, may mean a disastrous explosion. The heavy rubber belting is, moreover, least subject to the constant "stretch," which makes "taking up," an operation often necessary with other elevator beltings. Then, again, rubber belting does not require the dressing with oil, etc., that is absolutely essential to the life of a leather belt, and which, in a malt elevator, would be objectionable on account of the sensitiveness to foreign odors, etc., of the brewers' malt.

If "conveyors" are needed to forward the malt into its bin, a rubber belt, to which the necessary "flights" are bolted, is as likely as not to be found doing duty, or the malt is simply discharged onto an endless rubber belt having flanged edges, and running horizontally, that quickly transports the material to its destination.

While on the subject of rubber belting, it may be just as well to dispose of it finally by stating that whether working in dust or an atmosphere overcharged with steam or moisture, the rubber belt is the only belting that meets brewery conditions, hardly any other being used.



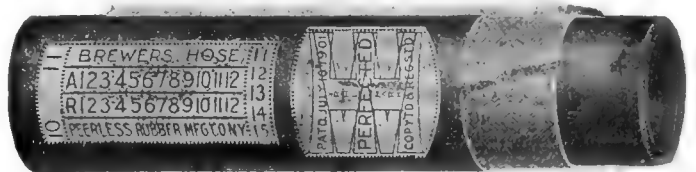
RUBBER BELT FOR CONVEYING MALT.

From the storage bins, the malt is weighed out as required and ground or crushed between rolls, in a malt-mill driven by rubber belting, on a lower floor; re-elevated into the ground malt bin, whence it descends as needed into the mash tubs, huge receptacles containing a powerful stirring apparatus, in which it is mixed with the necessary water and extracted. The spent grains, or exhausted malt, are removed by means of a manhole and chute, the ponderous manhole cover being made tight by means of a rubber gasket. Exposed to the action of fluids at a temperature from 212 degrees down and containing a liberal proportion of lactic acid, as well as to the wear of removal and scrubbing once or twice every day, there must be nothing flimsy or "shoddy" in the make-up of these gaskets, and they are specially made with a view to the conditions they are called upon to meet.

From the mash tub, the liquor extracted from the malt—the "wort," as the brewer calls it—gravitates to the kettles on a lower floor, huge copper receptacles, with steam-heating jackets or coils, as a rule, in which the wort is boiled with the hops. Here, again, more big manholes and more gaskets, this time of material capable of withstanding prolonged exposure to boiling heat without softening or imparting any rubbery or other foreign taste to the fluids with which they come in contact.

Cooled by exposure to the air in a great shallow pan, and by trickling over a stack of pipes, through which cooled water or refrigerated brine is passing, or into which the ammonia refrigerant from the ice machine is allowed to expand, producing a temperature much lower than freezing, the beer is then ready for the fermenting cellar.

The joints of these huge return-flow coolers must be made absolutely tight, and there is no other material but rubber that

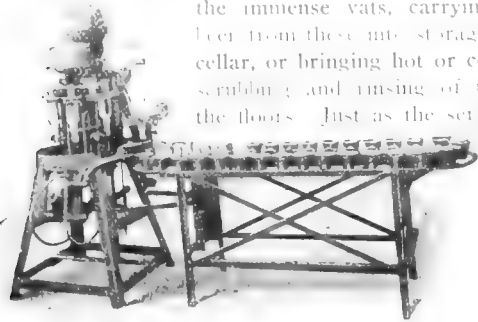


BREWERS' HOSE.

will insure this. Rubber washers or rings are depended upon to take care of the constant expansion and contraction of metal parts inseparably from the wide fluctuations of temperature in this apparatus. At the same time, they must be of a quality to resist brine, ammonia fumes, cold or hot or mildly acid fluids,

for it can readily be understood that even a small leak that would allow ammonia or some to escape into the beer would be disastrous.

It is when we reach the cellars that the importance of rubber in the brewery is really impressed upon us. Rubber hose squirms and coils on every hand, distributing unfermented beer among the immense vats, carrying the fermented beer from these into storage casks in another cellar, or bringing hot or cold water for the scrubbing and rinsing of the big casks on the floors. Just as the service the hose has



TRENCH'S BOTTLE WASHER.

to perform, so its construction is varied, and special grades are made for every purpose. Brewers' hose is a staple article with the manufacturers of industrial rubber goods, and the accompanying illustration shows the care with which the hose for brewers is built up. The interior tube is made of selected stock, carefully compounded to avoid breakage under pressure or by kinking, etc., for a break in the inner tube of a hose used for carrying beer makes it unfit for further use for that purpose. In the crevice of the break, yeast cells accumulate and decomposing furnish a breeding place for strange ferments, dangerous alike to the durability and flavor of the beverage. Then again it is necessary that this inner tube be of such a character that the acid or alcoholic constituents of beer, passing through or lying in it, will not soften or dissolve it, and cause it to impart a rubbery taste to the beverage. Over the inside tube and the layers of rubberized duck that enable it to withstand the interior pressure, is a special cotton jacket of herringbone weave and high tensile strength, which is caused to adhere to the body of the hose by an intermediate layer of pure rubber, while outside of this woven jacket comes the usual wear-resistant water-tight covering that is called upon to withstand the wear of impact, of dragging over concrete or rough-paved floors, edges of vats, etc., and at the same time to preserve the carrying capacity of the hose intact where it is subjected to sudden bends. It is only proper to say that this particular hose is protected by patents, but every manufacturer of rubber goods of this class has a similar special article for which equal or perhaps superior qualities are claimed, showing the care attached to the production of hose of this kind. When it is stated that the price of such hose runs from 47 cents per foot for 3-ply of $\frac{1}{2}$ inch internal diameter to \$5.60 per foot for 8-ply, 3 inches internal diameter, and that one of the largest breweries in greater New York purchases every year about 500 feet of hose, it is easy to realize the importance to the rubber industry of the United States of the demand for this article alone from the 1,500 breweries.

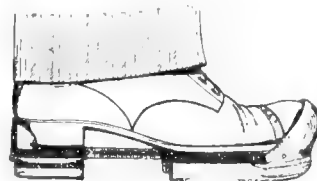
Another important use for rubber in the cellars is in the gaskets, with the aid of which the manhole covers of the big vats are made to fit tight. The vats or tanks used by brewers for fermenting and storing beer are commonly made of wood—oak, cypress, or white pine—smooth finished inside and coated with a "varnish" made of shellac and other ingredients, dissolved in high per cent. alcohol, which the workmen apply with a brush to the dry interior of the empty vessel; or they are given a coating of "brewers' pitch," a resinous preparation that is sprayed in a melted condition by heated compressed air over the inside of the cask to insure its even distribution. This is necessary to close the pores of the wood, which would otherwise allow the carbonic acid gas to exude and spoil the beer, or these same pores and interstices would become the breeding

place for various ferments which would cause its subsequent deterioration.

In many modern breweries these wooden vessels are now-a-days replaced by receptacles of welded steel, enameled inside and out, which it is claimed are much more durable, easier to clean and less liable to cause infection of the beer by wild ferments.

To afford means for entering these vats for cleansing purposes they are provided with manholes, and between the manhole cover and the wall of the tank a tight joint is effected by rubber gaskets. They are made especially for the purpose, heavy, of good stock and properly formed to fit the covers, for when in place and tightened up they must make a joint that is beer- and gas-tight under all conditions and certain to remain so for any period.

A peculiar foot-covering may be observed in use in the cellars, where rubber boots are always the fashion. It resembles in some respects the "patten" or clog our grandmothers affected and which in the Far East is still worn in wet weather. The lower part or sole of this shoe is of heavy rubber with prominent ridges or deep grooves and it is provided with straps by which it is secured over the ordinary foot covering.

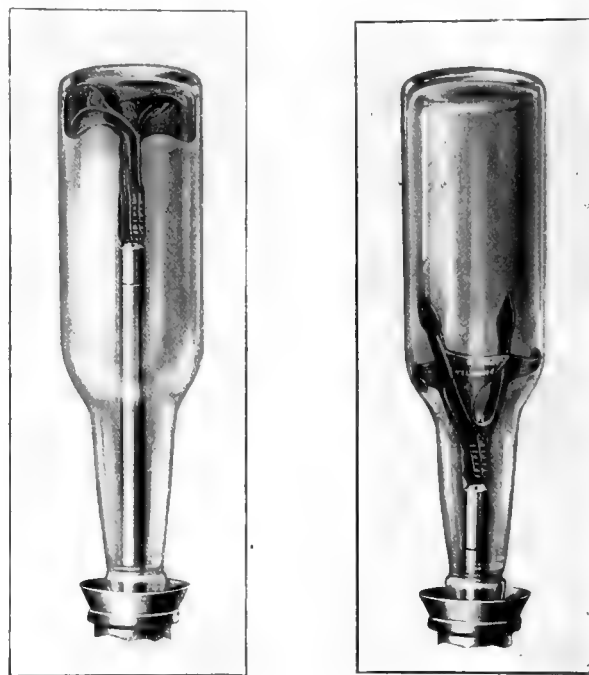


RUBBER SOLED CELLARMAN'S CLOG.

When the brewery workmen enter a varnished or enameled vat for the purpose of cleaning it, it is highly essential that their shoes shall not scratch the flooring of the vat; and in order to avoid this they wear this peculiarly constructed rubber clog, an illustration of which is here shown.

Rubber tips or edges for the shovels, scrapers, etc., used in cleaning these receptacles, are devised for the same purpose—to prevent scratching.

Having completed its fermentation the beer is pumped through hose into the storage cellars, where, in similar receptacles, but in the case of lager beer, hermetically sealed, it remains to



"BOTTLE KLEEN" RUBBER BOTTLE BRUSHES.

ripen and accumulate the wealth of carbonic acid to which it owes its foaming head and refreshing properties. The regulation of the proper volume of gas thus retained by the beer, its retention being dependent chiefly on the pressure it is under, the low temperature maintained and the tight bunging to which

it is subjected, was formerly an important part of the brewmaster's work and called for his unremitting and careful supervision. Of this responsibility he has been, to a certain extent, relieved by modern ingenuity. When his storage cask is full, he inserts in the bunghole the close-fitting rubber-sealed plug of what is known as a bunging apparatus, and it thus becomes part of a system by which all of the casks are connected by means of rubber tubing. While, with the aid of an ingenious contrivance, operating on the principle of a safety valve, but dependent on a mercury column in place of springs or weights for its regulating action, the gas pressure throughout the entire cellar is nicely equalized—or controlled to meet the brewmaster's requirements—according to the degree to which the valves have been adjusted. In other words, the little rubber pipe carries gas from the cask that has too much to the one that has not enough, so that other conditions being equal—uniform liveliness in the beer is insured.

A sudden change in the temperature of the fermenting or stored beer, which may easily be caused by the heat generated during fermentation, or what is less frequent, a drop below the proper fermenting temperature due to excessive cooling of the cellar, may make the "attemperator" necessary. This is a coil of pipe arranged in each tub and connected—again by the omnipresent hose—with the refrigerating plant, or a cold or hot water supply, so that cold water, colder brine, or even refrigerant gas or hot water, can be forced through the coil and the temperature quickly regulated. The necessity for an absolutely tight joint between the attemperator and its hose connection demands a rubber washer that will stand high or low temperature, pressure, etc., and never fail to take up expansion and contraction, as a leak would quickly spoil the beer. So that not only hose, but gaskets, connection washers and tubing of rubber, that are used in the cellar, must be of perfect quality, and upon their reliable excellence the success of the brewer's operations in this important department in large measure depends.

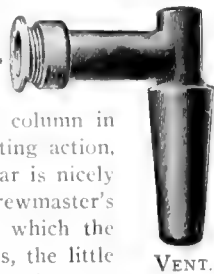
Another department in which rubber comes into its own is the wash-house, where the empty kegs, collected by the drivers, are "relaunders." It is a sloppy place, in which everybody wears rubber boots and rubber aprons, and into it, down inclined skids, rolls a ceaseless stream of kegs, a solid rubber buffer, at the bottom of the incline, modifying the impact of their arrival. They land in a great soaking tank and float carelessly around until their turn comes for the scrubbing machine, where revolving between huge brushes their external toilet is completed. Their rotation is effected by the revolving of the rubber-covered wheels on which they rest, the rubber insuring

the necessary friction and at the same time reducing the shock when the keg is thrown onto the machine. Thence it goes to the rinsing machine. One of its vertical spraying nozzles is entered in the bunghole, the weight of the keg, on a supporting collar, operates a valve that admits water in innumerable jets into its interior, and the washing process is complete. The impact of a heavy keg, dropped with careless suddenness on to the collar, would speedily ruin the valve mechanism, so a rubber bumper is provided to ameliorate the shock. Plenty of hose, with which kegs are rinsed, complete the equipment of this department.

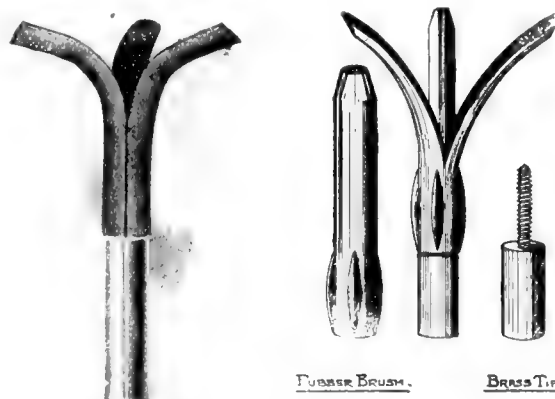
After draining and drying, the kegs are sent to the racking room, where they are refilled by machines designed for the purpose. But after leaving the storage vat, the beer must first be filtered to remove the minute or flying yeast cells, too light to settle by gravity and which would cloud the finished product, or start fermentations

that would impair its quality and appearance. The apparatus used for this purpose is what is known as a filter press, a ponderous device, with numerous plates, forming cells for the filter mass—usually a neutral cellulose substance—through which the beer is forced by powerful pumps, the result being to remove all the suspended solid particles and to leave it perfectly bright and clear.

To prevent leakage between the "frames" or plates they were primarily grooved to receive a packing of rubber, but this was not always satisfactory and, moreover, the prolonged contact between the beer and the frames often resulted in what was known as "metal haze," a dimness impossible of removal and exasperating to the brewer who prided himself on the clarity of his product. So in place of metal a manufacturer made the frames and grates of his filters of hard, vulcanized rubber, which, while stiff enough to furnish the necessary support for the filter material was sufficiently elastic to make a tight joint without the rubber packing. Another firm merely covered the metal frames with vulcanite, retaining the rubber packing, such frames being stronger and cheaper than the all-vulcanite article, both, however, accomplishing the same result—the obviation of contact between metal and beer. Still another form of construction was the hard vulcanizing of the part of the rubber packing that was inserted in the groove in the frame, leaving the exposed part soft and resilient to make a perfect joint. At the point in the frame where the continuous supply channel is located, a good rubber ring is used to insure tight connection.



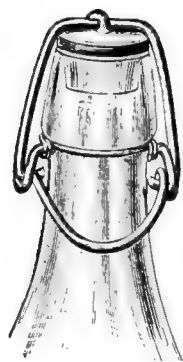
VENT.



RUBBER BOTTLE BRUSHES

The shipping packages are filled by means of a racking machine in which rubber tubing is everywhere in evidence. In some of these machines the plug, fitting the bung hole, through which the filling tube passes, is of rubber, and by a turn of a wrench is expanded to make it fit closely. The filling tube, sometimes made of hard rubber, extends to the bottom of the package and through it under the pressure developed by its own gas, supplemented, if necessary, by compressed air, the beer enters, filling the package solid with foamless liquid. A void would mean loss of gas and flat beer. When the package is full the filling machine bung is loosened and withdrawn and a wooden bung deftly inserted and hammered down tight.

The bung generally employed is known as a "vent bung," its central portion being so formed as to be readily punched through by the "vent" when the keg is "tapped." The vent is a simple contrivance which admits air to the package as the beer is withdrawn without allowing any escape of gas. It is of iron with a tongue-shaped valve of soft rubber and is driven into place by a few sharp taps of the mallet. When tapping the keg a cup-shaped device of solid rubber through a hole in which the spigot passes snugly is sometimes used to make close connection between spigot and package, and prevent escape and waste of beer. But this is going ahead of our story. Before the filled keg can be removed from the brewery a revenue stamp must be affixed to it in such a manner that the keg cannot be tapped without destroying the

"LIGHTNING"
BOTTLE STOPPER.

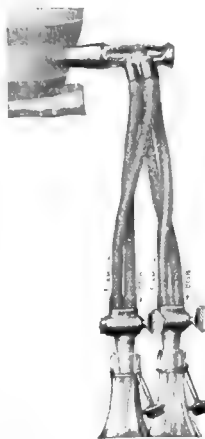
stamp. Before they are affixed the stamps must be cancelled as prescribed by the law by means of a dating cancelling rubber stamp, this being the method adopted by Uncle Sam to collect his share of the brewers' profits. When it is stated that the receipts from this source amounted in 1913 to \$66,266,989 it will be realized that this is a by no means unimportant part of the process.

Having duly complied with the Internal Revenue laws the kegs are ready for distribution to the dispensers. For this purpose trucks without end are called into service, no small proportion of the brewers' capital being invested in this means of transportation. Of late, in almost every brewery, the horse-drawn truck has been replaced by the automobile, some of the largest concerns, whose teams were a source of pardonable pride, having replaced them entirely with motors, the saving thereby in property space for stables, wagon space, yard accommodations, etc., being more than considerable. Brewers consequently are among the heaviest purchasers of rubber tires, nearly all of the solid kind, and in many instances the "block" tire, which is preferred as better suited for work in crowded city thoroughfares, and their cost is an item of great magnitude in the brewers' expense account. In the lighter delivery wagons, especially those for the distribution of bottled beers, a heavy pneumatic tire is often used.

Forming part of nearly every modern brewery is a bottling department, which, if not operated by the brewery itself—the case in most instances—is managed by a subsidiary concern in which the brewery is heavily interested. Here again we encounter rubber in many subordinate but none the less interesting forms.

First, as to the bottles themselves. Most of us are familiar with the old-time lever stopper, used as a closure for beer bottles and dependent, for the indispensable tightness of its seal, on a little disc or washer of rubber. The modern cork-lined tin seal or "crown" has largely superseded these stoppers, but many, especially provincial brewers and bottlers, find it inexpedient to make so drastic a change in their plant and equipment as the adoption of the crown-seal involves, and adhere to the old-time stopper. The rubber seal for this must be most carefully made. The material, which should contain not less than about 60 per cent of rubber, should be so compounded as to preserve indefinitely its form and elasticity without becoming soft or sticky under the solvent influence of the beer or owing to changes in temperature. The steaming process, known as "Pasteurizing," which involves the exposure of bottle and contents to a temperature of 140 to 150 degrees for the purpose of killing any ferments present, and to which a large proportion of the beer bottled is subjected, must not affect the "rubbers," as they are termed, nor must they suffer from exposure to soda water and other alkaline fluids used for cleaning purposes.

The bottles received in the bottling house, whether new or old, are invariably treated to a thorough washing. First they are fed into the "soaker," a huge wheel-like contrivance, in which the bottles held in receivers, which in some machines are padded with rubber, are submerged as the wheel slowly revolves in a great tank of hot water. Their inverted position as they emerge allows the water to drain out of them and they then pass to the washing machine. Here they are inverted over an upright nozzle that distributes

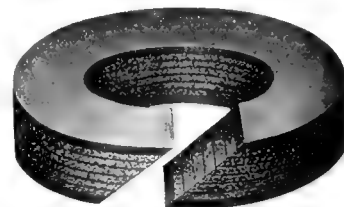


McKENNA HOME
BOTTLER.

water in a fine spray all over the interior, while a peculiar little brush or wiper of rubber entering from below and making some 2,000 revolutions per minute thoroughly washes or rather scrubs every part of its interior surface. These rubber brushes are of pliable but durable material and so formed that under the influence of centrifugal force as they are whirled around they reach and scrub every part of the interior of the bottle, even the cleaning of the inside of the neck being provided for by special ribs or fins. At the same time an outside brush of bristles scrubs the exterior, while a powerful spray of rinsing water completes the operation. The washed bottles are grasped by a hand-like device which places them, mouth downwards, in steel draining cups lined with rubber or some other non-absorbent resilient material, a number of these cups being attached to a moving belt on which they travel in endless procession to a point at which they are removed and set aside for refilling. Two of these machines with three men to tend them and the accompanying soaker will perfectly cleanse 35,000 to 40,000 bottles in a day of ten hours. The inconspicuous little rubber brush is an important factor in this operation and has been brought to great perfection. It must be of the most flexible elasticity, resistant to wear, so as not to cause delay by need of constant replacement, non-absorbent and reasonable in cost.

The cleansed bottles go next to the filling machine, which performs its operations very much after the manner of the keg-filler, filling the bottle with solid beer and shutting off the supply automatically when this has been effected.

For bottling beer in the home or even in small breweries where the demand is not constant and machinery would not prove profitable, the McKenna Home Bottler, illustrated herewith, is extensively employed. It is intended for use with the old-time lever or "Lightning" bottle stopper, with the rubber disc seal. It fills the bottle with solid beer, the foam being returned to the package. Both filling and return tube are of rubber and



RING PACKING.

a small tapered rubber plug, supplied with the device, forms a tight seal between the filling tube and the mouth of the bottle and prevents any escape of gas. The bottler shown is made for filling two bottles simultaneously. They are also made for filling one bottle at a time.

It may be in order to refer to a recent change in brewery arrangements that tends to augment the demand for beer-hose. Until a short time ago, in fulfillment of the Internal Revenue requirements, all beer removed from the brewery premises had to be put up in the regular shipping packages and stamped. This had to be done if it was only taken from the brewery next door to the bottling department and entailed much unnecessary labor. This has been changed. A gaged tank is provided in many breweries which is filled, under the supervision of an Internal Revenue official, with beer to be bottled. He assesses the tax in bulk on the number of barrels the tank holds, the necessary stamps are cancelled and the brewer pipes the beer into his bottling works and goes ahead. In many breweries the plant thus described is permanent and copper pipes with flanged rubber-gasketed joints carry the beer from one building to another. In quite a number the transfer is effected by means of a hose.

The filling machine—after the filling tube has been introduced into the bottle—by raising the base on which the bottle stands forces it up against a rubber plug or cap, thus sealing it tight during the filling process and preventing any escape of gas.

Into the closing or capping machine rubber does not enter, but the labeling machine has rubber wipers of the "squeegee" order, by which the gummed tickets are pressed smoothly in place on the bottle.



SEALING PLUG
FOR HOME
BOTTLER.

Rubber aprons and boots are as necessary to the men in the bottling house as the latter are to the cellar or washhouse man.

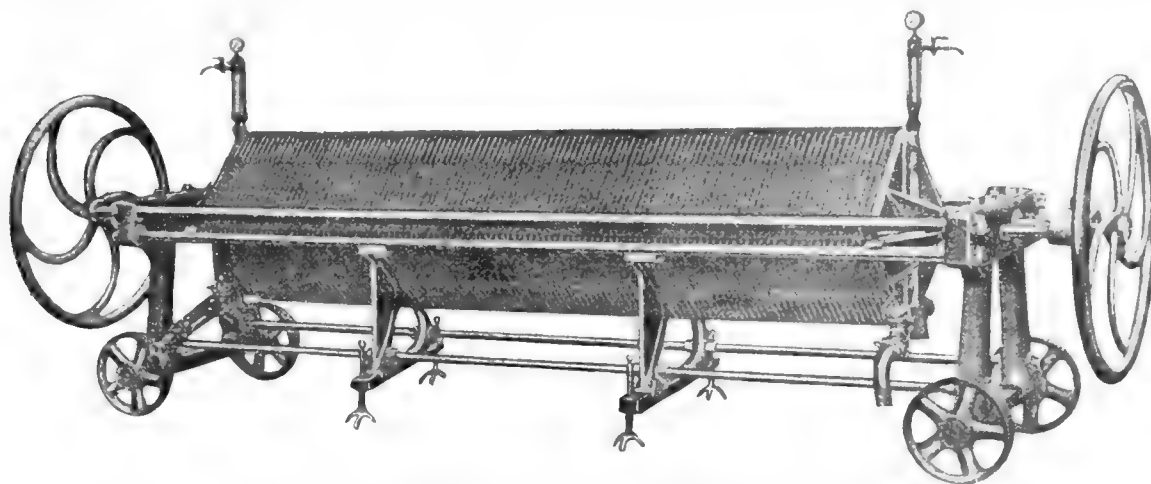
Reference must also be made to the large quantities of high grade packing required in the brewery. The steam engines, the numerous pumps for moving water, mash, hot or cold beer, for compressing air, etc., and the refrigerating apparatus in all its ramifications, all use packings in both the molded and sheet form and in every instance a high grade article, specially adapted for the purpose for which it is to be employed, is required. Rubber valves for the pumps are also in constant demand.

The electric equipment of a brewery, as to power, lighting, signaling, etc., is much the same as may be found in almost every modern industrial plant and uses similar insulating material, switch bases, etc., except that special care must be taken to counteract the rotting of insulation and short circuiting caused by the ever present and abundant moisture.

One feature of brewery electric lighting is, however, peculiar to these establishments. We referred above to the varnishing of the interior of the big wooden vats and casks with an alcoholic preparation. The atmosphere during this process becomes highly charged with inflammable alcohol fumes. The work is usually done by men wearing a smoke-helmet with the aid of an incandescent lamp, and in order that a careless workman may not break the bulb by allowing it to drop against the side of the tank it is customary to encircle it with heavy rubber rings or bands that act as a buffer. Lack of this simple precaution has on various occasions resulted in the incandescent film in a broken lamp igniting the alcohol fumes, with fatal results to the workmen and serious damage to the plant.

Their resistance to wear and the effects of moisture, make rubber mats and other floor coverings of rubber particularly desirable for brewery offices, while in the more pretentious establishments rubber tiling forms an artistic and lasting floor covering for the well appointed offices.

There is one more field in which rubber finds use in the brewery,



FILTER PRESS FOR BREWERIES. FRAMES AND GRATES OF HARD RUBBER.

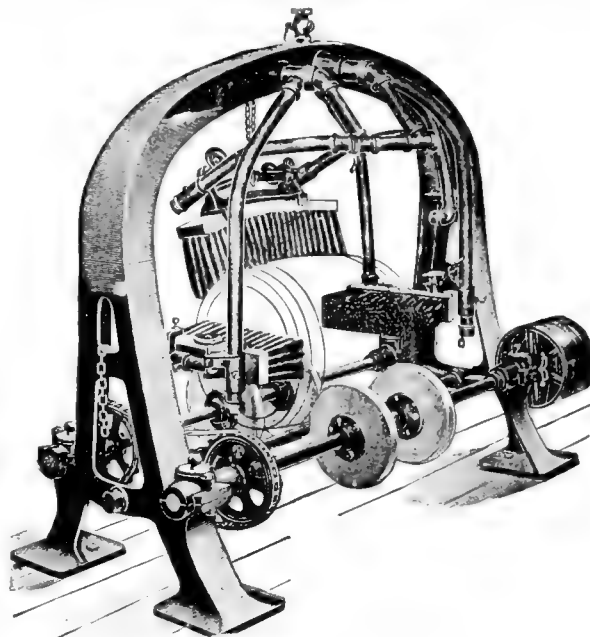
and that is in advertising. Enterprising concerns furnish their customers with rubber beer-glass mats bearing appropriate inscriptions. A very handy little tumbler washer, consisting of a stout wooden handle having at one end a rubber jacket with flexible fins or flanges on the bottom and side, a convenient and sanitary device for cleansing tumblers, is distributed to patrons by a well-known brewing company.

While precise figures are unobtainable as to the extent to which rubber tires are used for brewers' automobile trucks, a simple estimate will afford an idea as to the importance of the demand:

The brewery visited by the writer operates twenty-two motor trucks in its distributing department, and last year's bill for tires for these vehicles was \$6,000, or approximately \$270 per annum

for each truck. Another, much larger New York brewery employs many more automobile trucks and bottled beer wagons in the delivery of its product, and the expenditure for tires is approximately \$35,000.

In Greater New York there are between 50 and 60 breweries



KEG SCRUBBING MACHINE.

of all sizes. Assuming that they only used motor trucks for the distribution of their product in the same limited proportion as the brewery above referred to—which is not the case, some using few if any, and some of the big brewers using them exclusively—the expenditure for rubber tires would reach several hundred thousand dollars a year. These figures, however, are only approximate, there being no definite record as to the number of automobile trucks in use on which calculations could be based. That it amounts to a large sum our estimate sufficiently proves.

If we have omitted to mention any important purpose for which rubber is employed in the brewery it is because its uses are so manifold and universal that it is no easy matter in a single recital to refer to them all. Enough has, however, been told to make it evident that the modern brewery as at present equipped, without rubber would be an impossibility and that the brewer is a large and constant buyer of rubber goods.

If the supply of chicle, as we are led to believe, controls the cost of chewing gum, prices for that delectable luxury are likely to be high. For some lots 40 cents per pound has been paid in British Honduras and 26 to 30 cents are the prices quoted for contract chicle, the article as brought in by the gatherers, in square blocks, molded, as a rule, in five-gallon kerosene cans.

Some Interesting Letters From Our Readers.

TOO MUCH ANALYTICAL CHEMISTRY.

TO the Editor of THE INDIA RUBBER WORLD:

There is one point which I think is now worth bringing to the front, namely, that there is every indication that the well as the matter of chemical specifications. Back in the '80s the steel industry went through the same crisis—and came out of it with the conviction that for the user of steel the best course is to make his physical and service tests as severe as he chooses but to leave the method of meeting these requirements to the manufacturer.

You will probably remember that for a few years the Pennsylvania Railroad ordered its steel rails on a chemical formula evolved by the late Dr. Charles B. Dudley after a long and exceedingly able series of investigations.

There is very little left of that sort of thing now in the steel business; but there is altogether too much cropping up in the rubber business. As usual, the Governments and Government chemists are the chief offenders, for they in their contract work necessarily set the pace. This is as it should be, but it would be better if they confined to rigid specifications as to performance and left the means of meeting these specifications to those who presumably understand the matter best. CHEMIST.

[Coming as this does from one of the ablest of American rubber chemists, who from his residence in England has the American trade in good perspective, this suggestion should be very seriously considered.—The Editor.]

DIRECT SHIPMENTS OF RUBBER FROM DUTCH EAST INDIES.

SMALL quantities of the rubber product of the Dutch East Indian plantations are now being forwarded direct from Java to New York, and the writer of the following letter believes that arrangements for such shipments in larger quantities would be advantageous both to the producer and the manufacturer of rubber goods.

To the Editor of THE INDIA RUBBER WORLD:

We have shipped some rubber by steamship, now on the way from Java to New York direct, and will continue to ship every month; the regular service opened by the Dutch Colonial Lines between the colonies and New York enables us to do so. And you may be sure that many rubber producers will avail themselves of that service and that considerable quantities will be shipped monthly.

Under these circumstances the fact that England has prohibited the export from England and its colonies to the United States looks less serious. Our East Indian colonies, which include Java and Sumatra, are becoming large producers of plantation rubber, which will become evident to one who knows that up to June 1, 1914, in all 512,852 acres were planted, of which 312,003 acres with rubber alone, the rest interplanted with catch crops. Although a great many of these estates are controlled by English, and some by French or Belgian owners, the leasehold of every acre belongs to Dutch companies, as none but Dutch individuals or companies can have land rights in our East Indian colonies. Therefore we think the shipments to New York will grow more important the longer the English keep their frontier closed to you.

During the beginning of the war, after rubber had been declared contraband, several Dutch producers shipped rubber to England because they could not get the goods through to Hol-

land (our government has never interfered). But that "Great Britain became the only recipient of the whole of the Middle East supply of plantation rubber," as a certain trade journal puts it, is not a fact. It would be good if you would open the eyes of your readers with respect to this, so that they will know that the statements of this journal are not true.

We wonder why the Americans do not plant more rubber in our colonies, were it only to make themselves more independent in the matter of supplies. In our opinion, no country in the world can compete in rubber planting with Sumatra, where a price of 2s. per pound yields large profits. If you know of people who would be interested in such planting propositions we should be glad to help them to excellent and well situated land. PLANTER.

NEW YORK OR LONDON?

TO the Editor of THE INDIA RUBBER WORLD:

There are a few far-sighted prophets of greatness who affirm that ere long New York will be the center of the world's crude rubber trade; further, that this should be so—that the tax Great Britain forces us to pay for rubber is unnecessary, exorbitant, etc.

We do not agree.

First, as to the likelihood—England owns most of the plantation rubber, hence she is liable to market it at home. She, through her shipping, gathers in the African crop; and it is her boats that carry the Brazilian product. That means handling nearly the whole of the world's product through London if she so elects.

Second, as to the exorbitant tax we pay to England—she paid all of the first cost of experimental planting, and later did the financing of the great Far Eastern plantations. She furnished the men, machinery, transportation and scientific oversight that made *Hevea* planting a success. Why should she not get a good fat profit on her investment? Why should America, who has benefited enormously, even in thought, covet what belongs justly to England? NEW YORK.

BY RUBBER TUBE TO THE BOTTOM OF THE SEA.

Utilizing the waterproof property of rubber, Charles Williamson, of Norfolk, Virginia, has invented a deep sea tube with the aid of which it is possible to reach in comfort a greater depth than is accessible in a diving suit and to remain there for an indefinite period without physical discomfort. The apparatus he has devised for this purpose consists of a flexible tube, made of plates or scales, hinged together and overlapping one another and kept in place by rings or bands of malleable iron that form the skeleton of the structure and prevent its collapse. Over this is stretched a flexible waterproof covering of rubber and fabric, the whole forming a flexible shaft, open at the top and for its entire length and terminating at the bottom in a roomy, circular working or observation chamber. This shaft is provided with windows, from which, with the aid of an electric lamp lowered from above, a good view of the surroundings may be obtained. The occupant of the chamber can render valuable service in submarine operations, by making a careful survey of the bottom, and it can also be used to advantage for locating sponge growths, coral beds, pearl oysters, etc., or even the condition and position of a wreck known to contain valuables. It has been employed effectively in securing pictures of submarine life for moving picture films.

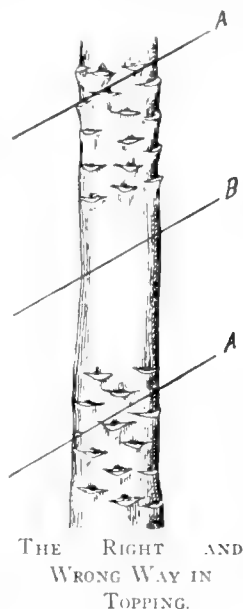
Rubber Essays of Universal Value.

THIS is a collection of twenty-six papers read at the International Rubber Congress, held at Batavia, in October, 1914—a gathering of which the world would have heard much more if it had not been for the mighty conflagration which burst upon Europe just before the time set for the meeting. The papers all deal with problems connected with the production of crude rubber, and to that extent may be said to represent the planter's point of view. They are, however, the work of broad-minded scientists who are concerned with the problem of producing the best article at the lowest cost. Not once is struck the false note of regarding the producer's interest as different from that of the consumer.

One of the most original and interesting of these papers is that of W. J. Gallagher, on "The Significance of Branching in Young *Hevea* Trees." Everybody knows that a tree or plant deprived of its proper amount of light will grow spindling, lifting its head ever higher, while the stalk is thin and weak. In the rubber tree it is evident that a thin stalk means a low bark area and a lessening of the latex producing cells. Mr. Gallagher takes the very practical view that no amount of sunlight is going to do the tree much good unless there are leaves to receive and utilize that light, in turning the crude sap into plant building material. To get a large leaf area there must be branches, and a young tree growing upward without branches is, though growing in the open, much in the same condition as if it were growing in a thicket. This is theory. A test was made in a field containing a number of branched and unbranched trees 2½ years old. The former showed a uniformly better girth. A later measurement showed a growth of girth in the branched trees of 3.2 centimeters, while the unbranched showed a gain of less than one centimeter. Branching having been induced, later, on the unbranched trees, they showed an actually greater rate of growth than the naturally branched trees. Other experiments confirmed the theory and showed among other things that the difference in branches and leaves had more effect on growth than the use or lack of manure.

As to methods of inducing branching, topping will at once suggest itself, but Mr. Gallagher points out that this plan has serious objection. His plan is stripping the young tree of its leaves—not by picking, but by cutting—leaving the petiole attached to the tree. In a few days this drops off and a young branch develops in the leaf scar, the result being a fine, well-balanced head. He does not believe in excessive pruning, but thinks the branches settle the question themselves in the survival of the fittest. He thinks branches should be allowed from 7 feet upward. There is no light gained for the leaves by tilting the crown a few feet. He says if the time comes that the plantation as a whole needs light the remedy is not to cut out branches but trees.

Mr. Gallagher says: "Topping should be done, if done at all, before the trees are two years old. The top should be cut off with a sloping cut, which should be immediately tarred. The cut should be made in the uppermost whorls of leaf traces, and not necessarily at ten feet high, but in the best place nearest to ten feet. Thus A is made at the right place, B is not.



This brings us to the subject of thinning, which is considered in a paper by Mr. E. B. Skinner. In the matter of close planting the experience of the rubber grower is not analogous to that of the northern fruit grower, a fact which had to be learned by hard experience. With the latter the produce of the young trees is as good as the old and the whole field may be swept clear at comparatively low cost. But with rubber, immediate returns are the least and, as the planting is for not less than a lifetime, the future of the big trees is the first consideration. Careful experiment shows conclusively that the yield, pound for pound, is better on widely planted than on closely planted equal areas, and of this, according to Mr. Skinner, at least 10 per cent. more is No. 1 rubber. In addition, he shows, conclusively meeting arguments to the contrary, that the cost of harvesting per acre is less with wide than with close plantings. In the beginning Mr. Skinner would plant about 100 trees per acre, and these he would reduce not by cutting out rows, but by selection for elimination of the least shapely or thrifty, and after bearing has begun, of the least productive trees. Always he would have the end in view that the remaining trees must have all the light and air they need. When the elimination of a tree is decided upon he would have it out and done with. The system of pollarding or cutting away the top and tapping the dying stump, he says, does not pay for the labor and nuisance entailed.

The subject of "Seed Selection" is treated by Dr. P. J. S. Cramer, Chief of the Plant Breeding Station at Buitenzorg. The points he makes are briefly summarized and are as follows: Choose seeds from old trees whose qualities have been tested by long experience. Choose, of course, the best from every point of view, yield, health, size and sturdiness. Do not tap the trees selected as seed bearers; let them put all their energies into giving strength and vitality to the seeds. If possible have one part of the plantation set aside for seed bearing and cut out all inferior trees so that there will be no deterioration by cross fertilization. Use seeds from your own plantation; what you want is not only seeds from trees which produce well, but which will produce well under the peculiar conditions of your plantation. If it is not possible to furnish your own seeds get them from a similarly located plantation and from trees of known history.

Several papers treat of diseases of *Hevea* and the best means of counteracting them, but that of H. Colenbrander is of particular interest in telling how vigorous and courageous treatment saved a plantation of 3-year old trees infected with *Fomes Semitostus*, the white root fungus disease. In this case the usual work of freeing the soil from infection was carried out, but by the time it was done nearly all the trees were infected.

In the drastic treatment which was administered to the most badly infected the trees were actually lifted from the ground, the tap roots, most of the main roots and all the hair roots were removed and the little left thoroughly soaked with disinfectant. The trees were left with so little root support that they had to be propped up to keep them from toppling over. The leaves dropped off, and of course growth ceased while the trees, out of their reserve strength, were developing new leaves, new hair roots and, finally, a new system of main roots. But the check was only temporary, and after 3 months growth was resumed with full vigor. It would make an American orchardist rub his eyes to learn that the cost of all this work was less than 20 cents per tree in American money equivalent.

The tempting subject of catch crops is considered in several papers, and while all seem to wish it were possible to reach a good revenue from the ground on which the young rubber trees are maturing, not one is able to suggest any crop or plan which makes any sure promise of profit.

"Methods of Coagulation and Preparation of Plantation Rubber" is a paper which cannot fail to interest the rubber man in the market place. It is by B. J. Eaton, Government Agricultural Chemist of the Federated Malay States. After stating that the coagulant used on at least 99 per cent. of the estates is acetic acid, he proceeds to lower the colors of those who criticize acetic acid as a "chemical" by informing them that it is acetic acid in the smoke of the Brazilian native gatherer which produces the admirable results in coagulation to which the critics have been pointing. In the use of this acid care must be exercised, like soda in the biscuit, there must be neither too little nor too much. Too concentrated a solution forms clots, too dilute will not work at all. It is possible to use sulphuric acid, but its less cost is not held to warrant the risk its use involves. The latex is coagulated 40 or 50 gallons at a time, and after four hours is removed from the pans. The coagulum is then passed between rollers to expel the greater part of the moisture, placed in racks to drain and the sheets are removed to the drying room the same evening. The smudge is usually made of cocoanut husks with the addition of indifferent woods and continues 10 to 14 days, or slightly longer.

The subject of smoking and its effects are considered in the foregoing paper, and also in one by G. Stafford Whitby. Probably there are very few who do not believe that the dark color of rubber is due to the particles of carbon from the smoke. That this is not true may be seen at once in the fact that the rubber

when it leaves the Amazonian fire is still nearly white and that it darkens afterward. It is now practically certain that the darkening is caused by an oxidizing enzyme present in the latex and its action on certain oxidizable substances naturally present in the latex, but which may be added to by the smoke. The addition of sodium bisulphite to the latex neutralizes this enzyme, with the result of a very pale rubber. Mr. Whitby thinks that smoked rubber is undoubtedly preferable to unsmoked and attributes it in part at least to the warmth of the heavy smoke.

Some of Mr. Whitby's remarks might be summarized by saying

that rubber is rubber. He says that color is no indication of quality; that there is little or no relation between the tensile properties of raw rubber and the same rubber in a vulcanized state; that the defects of appearance arising from various causes and known as oversmoking have nothing to do with quality, and that the same is true of the appearance of small bubbles in the sheet.

"Labor Conditions in Malaya," by Patrick Hadon, will give comfort to many uneasy consciences disturbed by the thought of the low wages paid to the plantation laborers. Mr. Hadon states that the "feeding, clothing and housing of the coolies is, in many instances, far better than that of the poorest classes in Europe"; that they are beginning to invest in gramophones and bicycles, and that the conditions surrounding them are "extraordinarily happy ones compared

with those existing in the countries from which they are imported."

Space forbids that we should notice the other interesting papers before us, but all are of high standard.

OTHER AWARDS AT BATAVIA EXHIBITION.

In recognition of his comprehensive exhibit of samples of wild rubber and rubber substitutes, a diploma of honor was awarded to Henry C. Pearson, editor of this publication.

As already recorded, THE INDIA RUBBER WORLD cup was given by the jury to the Belgian Colonial Ministry for the best exhibit of wild rubber.

For rubber washing, creping and sheeting machinery, the firm of David Bridge

& Co., Limited, Castleton, Manchester, England, received the highest award, a diploma of honor. For a complete experimental vulcanizing installation for testing stations the same company received a similar award.

A diploma was awarded to the firm of Gido Redjo for the excellent collection of rubber samples prepared by Brazilian method.

The work of art donated by His Excellency, the Governor-General of the Netherland Indies, was presented to the East Sumatra Association of Rubber Planters, for its exhibits of dwellings constructed on approved hygienic principles.



VIEW OF OLD BATAVIA.



THE BEAUTIFUL BOTANICAL GARDENS, BUITENZORG, JAVA.

The omission from the list of honors, in connection with the organization of the recent Batavia Rubber Exhibition and Congress, of Mr. J. Liefstinck, secretary of the undertaking and one of the hardest workers for its success, is resented by planters throughout the archipelago, and it is proposed, according to the "Straits Times," to show recognition of his services to the planting community by a suitable presentation.

MANURING EXPERIMENTS WITH HEVEA.

In a report issued by the International Rubber Congress and Exhibition for 1914 at Batavia, Dr. A. J. Ultee presents the following summary of manuring experiments with *Hevea* made in Java:

No manuring experiments have been made yet in which the yield of rubber of manured trees was compared with that of control trees.

The increase in circumference of the stem has always been taken as a measure for the results, so that it is difficult to form a judgment on the advantage of manuring. The experiments in Java, four in all, were, with the exception of a single one, not complete; they did not extend further than the comparison of full manuring or of a single manuring substance with unmanured control trees. For the rest they satisfied the conditions which must be applied to such experiments.

In two cases no effect of the manure was noticed; in the other two an increase in circumference, although not considerable, was distinctly observed.

LIGHT COLORED RUBBER.

In a similar report Dr. Ultee makes the following observations regarding light colored rubber:

Although with a single exception there is no relation between the color and the quality of rubber, the light colored product always fetches a higher price.

The color is a result of an oxidation process which is accelerated by the enzymes present in the latex. By rendering the enzymes inactive or by adding reducing substances this reaction may be prevented, while it will proceed less quickly if the rubber is soon dried.

The enzymes may be rendered inactive by heating the latex or the rubber for 15 minutes to 80 degs. Centigrade (176 degrees Fahrenheit). In Java this process has practically been abandoned and replaced by treating the latex with sodium bisulphite (NaHSO_3).

That this does no harm to the quality of the rubber has been proved pretty certainly by testing the vulcanized product and by viscosity determinations. The only drawback is that rubber treated with bisulphite dries more slowly, so that one has to be careful in its application.

About artificial drying, no new points of view have recently been expressed. Whether the quality of the rubber deteriorates by quick drying has still to be proved.

According to "Der Seifen Fabrikant," the surplus rubber tree seed from the plantations in the East is to be sent to England, where the oil it contains will be extracted by crushing. This oil, of which the seed, according to our German contemporary, contains 42.3 per cent., resembles linseed oil in appearance and odor and like it is a drying oil. Experiments show that it makes an excellent soft soap and for this purpose it is proposed to use it.

The "Tijdschrift voor Nijverheid en Landbouw in Nederlandsch-Indie" has issued a special number devoted to the 1914 Rubber Congress held at Batavia last Fall and covering the events and achievements of the congress day by day. The booklet is neatly gotten up and well written. It gives special attention to the meetings and the addresses of the notable scientists who gathered at Batavia to discuss the latest progress in the rubber world. The addresses dealt with subjects such as diseases of *Hevea*, experiments with fertilizer, reducing the cost of rubber, and other practical and scientific aspects of the industry.

MORE MONOGRAPHS ON RUBBER INDUSTRY.

Two more of the interesting hand books which the "Gummi Zeitung" is publishing on the various aspects of the rubber industry have appeared.

The first is "Hartgummi und Hartgummi-Ersatz," by Ingenieur A. Regler.

Hard rubber in its many forms has played of late a very large part in the world's trade. Of course a great many of the manufacturing processes in the production of hard rubber goods are secret and carefully guarded by their owners. This refers not only to real hard rubber, but possibly even more to substitutes, of which a number have gained international fame. In this hand-book the author gives a short description of the different methods employed in the manufacture of hard rubber substitutes, dividing the treatment into two classes—the dry and the wet method. Substitutes, however, occupy only a small part of the book, the main part being taken up with hard rubber proper. It is, of course, impossible to describe intimately the different chemical and technical processes in the production of hard rubber, and only a short outline is given. The manufacture of hard rubber dust out of old, hard rubber waste is given considerable space. Especially interesting are the articles on the manufacture of hard rubber goods of every description. This book, like the remainder of the series, is noteworthy for the clear presentation of facts and the elimination of unessential matter.

The second booklet is "Die Reparatur von Autopneumatiks," by Paul Scharffenroth.

This eleventh volume aims to serve as a practical guide to auto tire repairers. It should prove especially useful at the present moment in Germany, when private owners of motor cars have to be content with the defective tires allowed them by the military authorities. Quite apart, however, from the necessities of the present moment, auto tire repairing has become a considerable industry during the last few years in Germany, and many workmen have found tire repairing and the erection of little shops for this purpose the stepping stone to independence. According to the author, a repair shop can be started in Germany with a very small initial outlay. A well-equipped shop would require about \$1,500. The hints given and the rules laid down in the volume are of a practical character, and the author does not waste much time with scientific explanations, but confines himself to practical information. Of course, the book does not bring out anything new or startling. All the advice given is along orthodox lines. The advantage to the reader lies in the fact that everything is clearly and plainly presented. There is a chapter on mistakes in repairing. The chapter on hot vulcanization is particularly well illustrated. Other illustrations show the beginner how a cover can easily be turned inside out. One chapter deals with tools and gives advice as to their selection.

THE AMERICAN EXPORT TRADE DIRECTORY.

This book gives a complete list of the export commission houses, foreign buyers, manufacturers' export agents, foreign exchange banks and marine insurance companies in all the principal ports of the United States. It is divided into twelve parts. The first part, which fills 200 pages, is devoted to an alphabetical list of the export commission houses in New York, the branch offices in that city of foreign concerns, and the export houses in Boston, Philadelphia, Baltimore and other ports.

Part 8 gives a complete review of the steamship service from American ports to foreign countries. Part 10 contains a list of the consuls of foreign countries in the United States.

There is a good deal of other information of interest to manufacturers, all classified and indexed for immediate reference.

It is a Fourth Edition, compiled by Olney Hough, and published by The Johnston Export Publishing Co., 17 Battery Place, New York.

Fifteenth Annual National Automobile Show.

THE Fifteenth Annual National Automobile Show, held at the Grand Central Palace, January 2-9, was well attended and the exhibits were unusual both in number and interest. There were shown 528 cars, ranging in price from \$295 to \$6,000—81 different makes of gasoline vehicles and 6 of electrics. There were 13 motorcycle exhibits and 236 of accessories. The aggregate value of the exhibits was estimated at \$3,560,000.

TIRES AND ACCESSORIES

Automobile tires and their accessories, of course, formed the chief item of interest to the rubber trade. The following tire equipment was noted on cars in the exhibits of twelve prominent manufacturers: Fisk, Federal, Firestone, Goodrich, Goodyear, Kelly-Springfield, Pennsylvania and United States. Many of the companies had attractive and instructive displays.

The Braender Rubber & Tire Co., of Rutherford, New Jersey, exhibited its new "Bull Dog" non-skid tire, an illustration of which appeared on page 154 of the December number of this publication.

The Brown Scientific Tube, a tire tube that is self-closing when punctured, was shown by Story & Reed, of New York.

Dayton Airless tires, which are neither solid nor pneumatic,

The Dreadnaught Tire & Rubber Co., of New York, had the largest and most complete exhibit devoted exclusively to tires. This company features the patented Dreadnaught Vacuum Tread non-skid "that has the grip to it." It is made of the best material, double frictioned, and has a heavy pure gum cushion, single cure molded tread. All Dreadnaught tires are guaranteed for 5,000 miles and to be free from defects of material and workmanship, and each tire bears a serial number.

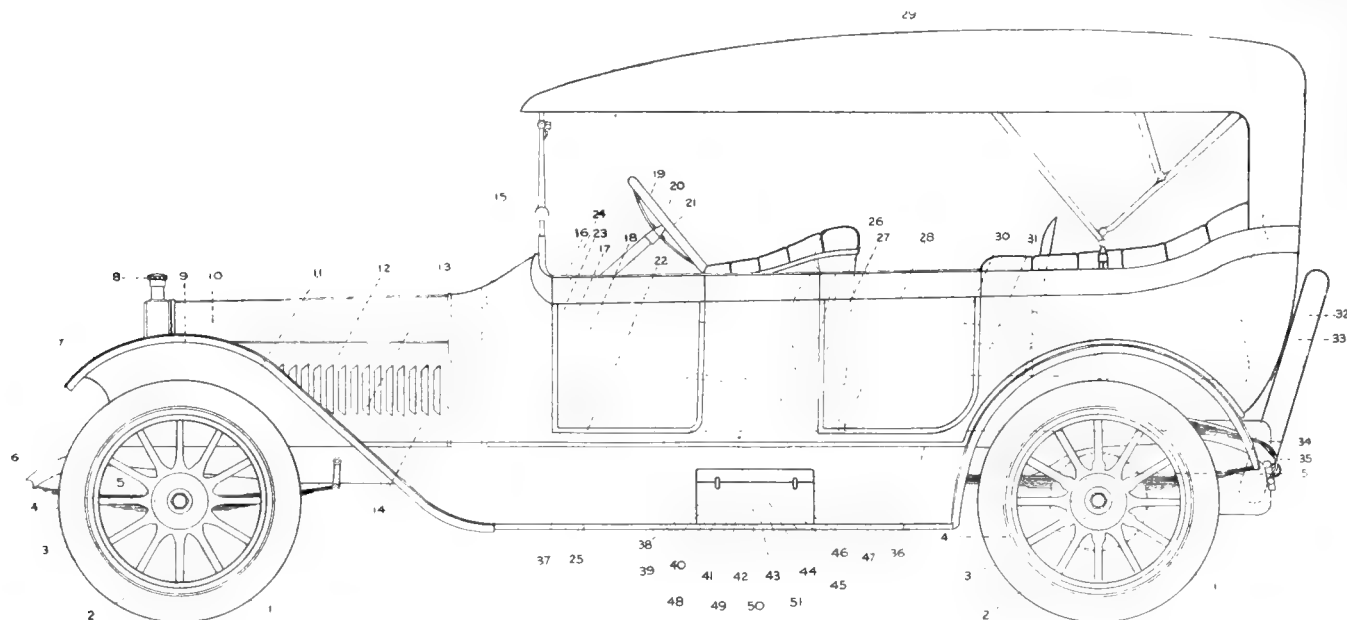
The Essex Rubber Co., of Trenton, New Jersey, had an effective display of its Essex red inner tubes, patches, plasters, reliners, etc.

The Globe never-skid tire and red inner tubes were exhibited by the Globe Rubber Tire Manufacturing Co., of Trenton, New Jersey.

The Gordon tire, manufactured by the Gordon Tire Co., of Canton, Ohio, under the "Tri-Angle" brand and a 4,000-mile guarantee, was shown by the Ireland Rubber Co., of New York.

The Leather Tire Goods Co., of Niagara Falls, New York, showed Woodworth tire treads and "Easyon" tire chains.

The Marathon Tire & Rubber Co., of Cuyahoga Falls, Ohio, exhibited a complete line of tires and inner tubes. The company specializes in hand-made products, tires in all sizes for all styles



THE INDIA RUBBER WORLD 1915

THE 1915 AUTOMOBILE AND RUBBER.

1—Rubber Tires, 2—Rubber Inner Tubes, 3—Rubber Reliners, 4—Rubber Quick Dismountable Flaps, 5—Rubber Spring Bumpers, 6—Rubber Fender, 7—Rubberized Lamp Cover, 8—Rubber Gasket, 9—Rubber Fan Belt, 10—Rubber Radiator Hose, 11—Dynamo Rubber Insulation, 12—Magneto Rubber Insulation, 13—Magneto Hard Rubber Connections, 14—Electric Starter Rubber Insulation, 15—Wind Shield Rubber Channel, 16—Hard Rubber Switch Bases, 17—Hard Rubber Switch Connections, 18—Rubber Pedals, 19—Hard Rubber Steering Wheel, 20—Hard Rubber Control Buttons, 21—Rubber Insulated Control Wires, 22—Rubber Matting, 23—Rubber Door Bumpers, 24—Hard Rubber Door Handles, 25—Rubber Running Board Matting, 26—Hard Rubber Door Handles, 27—Rubber Door Bumpers, 28—Rubber Matting, 29—Rubberized Top, 30—Rubberized Side Curtains, 31—Rubberized Boot, 32—Spare Rubber Tire, 33—Rubberized Tire Cover, 34—Hard Rubber Rear Lamp, 35—Rubberized Lamp Cover, 36—Storage Battery Rubber Insulation, 37—Electric Gear Shift Rubber Insulation, 38—Rubber Blow-Out Patches, 39—Rubber Tire Boot, 40—Rubber Bucket, 41—Rubber Cement, 42—Rubber Tire Tape, 43—Rubber Cementless Patches, 44—Rubber Repair Stock, 45—Rubber Lugs, 46—Rubber Tubing, 47—Rubber Pump Connections, 48—Rubber Packing, 49—Rubber Brake Lining, 50—Tire New, 51—Rubber Valve Bases.

and which carry a guarantee of 8,000 miles on light cars and 5,000 miles on heavy cars, were exhibited by the Dayton Rubber Manufacturing Co., of Dayton, Ohio.

The Double Fabric Tire Co., of Auburn, Indiana, showed their "Double Rubber" inner tube, made of multiple plies of alternate red and gray rubber. They also exhibited the "Interlock" inner tube, Gray inner tubes, Red liners, "Jumbo" and "Adjustable Look On" outer boots. They claim to be the largest concern in the world devoted exclusively to the manufacture of tire reinforcements and tubes.

of rims, in angle and smooth treads. Its inner tubes are made in six and nine plies, by which possible flaws are corrected.

A tire of novel tread construction which includes a dual cushion tread, triple arch tread, staggered tread and the vacuum cup idea, was the "Mussinan" exhibited by the Mussinan Tire Co., of New York. The object of this construction is to minimize skidding, punctures and blow outs.

The Rubber Tire Accessories Co., of New York, distributors of Dixie tires, made by the Dixie Tire & Rubber Co., of New York, and also of "Pyramid," "Red Wing," "Silver Grey" and

"Isbest" inner tubes, made by the Greensburg Tire & Rubber Co., of Greensburg, Pennsylvania, had an exhibit of the output of these concerns.

An attractive and enterprising display was that of the Rutherford Rubber Co., of Rutherford, New Jersey. Here could be seen the actual building up of a tire casing by an expert tire maker. Frictioned fabric cut on the bias to length was applied to a core mounted on the usual tire jack. The beads were applied in the usual manner, followed by the breaker strip and the tread, affording the layman an excellent object lesson in tire building.

It goes without saying that no automobilist can afford to be without an inner tube repair kit. The Samson Repair Plug Kit centers about strong metal discs covered with rubber. One is placed on the inside and the other on the outside of the puncture and they are screwed tightly together, making a complete repair. Exhibited by Stevens & Co., New York.

The Standard Woven Fabric Co., of Framingham, Massachusetts, showed a well-made rubber fan belt, rubber lined fire hose and a new brand of tire tape.

An interesting tire consisting of an outer casing and an inner tube, the whole called the Steel Pneumatic Tire, was exhibited. It is guaranteed against punctures, blow outs, rim cuts, etc. The casing is similar to the usual type except that the beads are omitted and the thickness of the tread materially increased. The tube is made up of a number of sections, each containing a steel cylinder in which a fixed air pressure is automatically maintained by the movement of the wheel on the road. There is a piston to each cylinder which inflates the tire automatically. Shown by the Steel Pneumatic Tube & Tire Co., of New York.

Chas. O. Tingley & Co., of Rahway, New Jersey, exhibited a complete line of automobile and cycle sundries. Under their brand C. O. T. are hook-on and laced boots, the regular inside patch and a special one for Ford cars. There were also patches that sick and cementless patches in red and gray, rubber-rimmed goggles, gas tubing, lamp connectors and cement in tubes.

The Vail Rubber Co., of Chicago, showed general motor tire accessories, as, for example, Dyke's Ever-Stick Reliners—a complete inside reinforcement made of five-ply fabric vulcanized together on the bias; the molded reliner made of four-ply fabric; Dyke's Never Creep Double Lock and Lace-On outer boots, etc.

At the booth of the Voorhees Rubber Manufacturing Co., of Jersey City, New Jersey, was a complete line of auto accessories and repair stock. Their "Ideal" red tube is made by a special process, and each tube is packed in a strong duck bag to prevent chafing and damage.

The K. C. "No-Stretch" boot is a steel studded leather and rubber accessory that is guaranteed for 2,000 miles. By combining rubberized tire fabric, stretched by a special process, with prepared leather, water resisting and wearing qualities are obtained. It is quickly applied by hooks which fit under the clinching ring. Shown by The Western Tire & Rubber Co., Kansas City, Missouri.

A. W. Rossen & Co., New York, exhibited Woodworth studded treads, intended to prevent punctures and protect tires from road wear and skidding. These are easily applied and prolong the life of the tire. The Woodworth ventilated rubber tread is a steel studded tread that has an annular protecting strip made of rubber reinforced with fabric, to prevent punctures. All these leather tread specialties are reinforced on the inside with strong waterproof fabric.

AUTO TOP FABRICS.

Top fabrics in increasing quantities are being produced to meet the rapidly developing demand, and several displays were made by manufacturers of this waterproof material. A very comprehensive exhibit of mackintoshes, cloths, auto leathers or rubber cloths was that of the L. J. Mutty Co., of Boston. Their "Numotor" cloth, which is new, is made in single and double texture to match the auto top. All of these double tex-

ture fabrics are interlined with one of three grades of rubber coating, "Bulldog," "Superior" and "Standard." The Bulldog in particular is guaranteed absolutely waterproof and non-separable. The standard is for curtains, seat covers, etc.

An exhibit of material for automobile top coverings, guaranteed absolutely waterproof without time limit in any climate and under all circumstances, was that of the F. S. Carr Co., of Boston, manufacturers of the "Neverleak" top covering.

The Laidlaw line of automobile fabrics shown by Laidlaw Co., Inc., New York, embraces a complete assortment of patterns and textures. The Laidlaw "Storm King" top covering is a rubber surfaced, rubber interlined top cloth made in bright or dull finish, long straight grain or pebble grain.

AUTOMOBILE ACCESSORIES.

Pedal pads for all makes of cars were shown by the Auto Pedal Pad Co., of New York, their "Perfection" pads being especially in evidence.

The Gabriel Wind Shield Cleaner is a rubber squeegee arranged on the wind shield. The pull of a string removes any moisture collected on the glass. It is made by the Gabriel Horn Manufacturing Co., Cleveland, Ohio.

Another novelty is the "J. H." tonneau or rear seat shield. It is made of glass and rubberized fabric. It is adjustable and can be folded, occupying little space when not in use. It is manufactured solely by Mutual Auto Accessories Co. of America, New York.

Herz's Tape Grip Ring is not rubber, but is associated with it. The ring and a short length of tape make a practical connection between rubber hose and metal pipe. It is simple and easily attached or disconnected. Herz & Co., New York.

Charles E. Miller, of New York, exhibited the well known line of specialties and auto accessories manufactured by this enterprising firm.

A very practical auto bucket made of the finest quality of maroon rubber, cloth lined—the product of Whitall Tatum Co., New York—attracted much interest.

A great variety of molded articles in either black or brown, highly polished or dull finish, used in electric insulation and apparatus was shown by the Essex Rubber Co., of Trenton, New Jersey. Automobile radiator filler caps, switch buttons, handles and bases, steering wheels, handles for cutlery and many other articles made of Condensite were also shown.

MISCELLANEOUS.

There were many novelties shown not made of rubber, and some which depend for their usefulness on hose, tubing or a rubber gasket.

Among the exhibits of manufacturers closely associated with the rubber trade, but not engaged in the production of rubber goods, one of the most notable was that made by the Cutler-Hammer Clutch Co., of Milwaukee, manufacturers of the magnetic clutch and brake used in most of the large rubber mills.

Another was the Westinghouse exhibit where there was an electric device for nearly every need. For the automobile and garage there were battery charging outfits, tire vulcanizers, small motors for driving tools, starting, lighting and ignition systems.

Several of the vulcanizer companies displayed their wares, including Henry Adams & Co., of Chicago; the Marvel Auto Supply Co., of Cleveland, Ohio, who showed two models, A and C, intended respectively for small repair and for repairs on large tire casings; the Positive Tire Vulcanizing Co., of Davenport, Iowa, who exhibited two portable vulcanizers, one for repairing inner tubes and the other for mending surface injuries to casings, etc.; the C. A. Shaler Co., of Waupun, Wisconsin, whose exhibit included the well known Vul-Kit vulcanizer and also the Tube-Kit, Cycle-Kit and Ford-Kit.

The Autoped Co. of America, New York, covers the field of the bicycle, motorcycle and the horse vehicle combined. It is

portable, motor driven and has two wheels, with carrying platform below the axles. The passenger balances himself on this platform by means of the steering bar and handles, in which are the controls of the self-contained motor mounted on the front wheel.

The Newmastic Co., of New York, had tire filler on view.

A number of the rim manufacturers showed their line—the Ashley Wire Wheel & Rim Co., the General Rim Co., of New York, and the Standard Welding Co., of Cleveland, Ohio.

F. Edlmann & Co., of Chicago, showed tire gages.

A. Schrader's Son, Inc., of Brooklyn, showed the full line of valves, tire pressure gages, etc., manufactured and sold under their well and favorably known brand.

The Cleveland Worm & Gear Co., of Cleveland, displayed a new tire instrument for removing and replacing clincher tires.

THE AUTOMOBILE SALON FOR 1915.

THE Automobile Importers' Alliance, Inc., held an Automobile Salon in the ballroom of the Hotel Astor, January 29, where many of the foreign cars were exhibited.

The Canadian Dunlop tires shown at this exhibition were the Traction Tread, a real anti-skid tire, the Cross-Groove tread for all-year-round use, and the Dunlop "All-Red" inner tube. The virtues of these tires are set forth in claims for perfect traction, minimum punctures, more resiliency and anti-skidding.

Another tire of novel tread design is the Faure never-skid. These are made with reinforced casings and are furnished in over-size and double-over-size interchangeable sizes.

The Hardman Tire & Rubber Co., of Belleville, New Jersey, exhibited their single cure wrapped tread tire with the sure grip tread. The manufacturers lay special stress upon the process by which the tire is manufactured—the best of material and the final cure.

While Michelin tires were in evidence in the equipment of several of the exhibits, there was no special display of this well known product. The anti-skid leather tread tire with steel studs is a well made and practical looking tire. There were also cars equipped with Firestone, Goodrich, Silvertown Cord and other standard makes of American tires.

PROCEEDINGS OF THE SOCIETY OF AUTOMOBILE ENGINEERS.

IN connection with the annual meeting of the Society of Automobile Engineers, held in New York, January 6-7, the standards committee of that organization at its meeting considered and approved the reports of 14 different committees bearing on the question of standardizing different automobile parts, including some of notable interest to manufacturers of rubber tires.

Among these reports was one on a new schedule of tire and rim sizes, presented by the pleasure car and commercial car divisions of the standards committee. This schedule, the result of prolonged labor, will specially interest tire makers because of its simplification of their business. In place of the almost endless range of tire sizes, manufacturers are now called upon to produce and stock, the following schedule of nine sizes, adapted for rims of 30 x 3 to 38 x 5½ inches, inclusive, had been prepared by the divisions, together with a list of nine odd or oversize tires, intended for use only by consumers who are desirous of increasing the tire capacity of their cars beyond that intended by the builder. The new schedule, which was included in the report of the pleasure car's division read by Mr. E. R. Hall, of the Goodyear Tire & Rubber Co., was adopted without discussion by the general meeting and has been endorsed by the Clincher Automobile

Tire Manufacturers' Association. With its nine sizes each, of tires and rims, it is designed to take the place of a list of more than 50 sizes of tires.

Rim sizes.	Even tire sizes for manufacturers and consumers.	Odd or oversize tires (for consumers only).
30 x 3	30 x 3	31 x 3½
30 x 3½	30 x 3½	31 x 4
32 x 3½	32 x 3½	33 x 4
32 x 4	32 x 4	33 x 4½
34 x 4	34 x 4	35 x 4½
34 x 4½	34 x 4½	35 x 5
36 x 4½	36 x 4½	37 x 5
36 x 5	36 x 5	37 x 5½
38 x 5½	38 x 5½	39 x 6

A new 36 x 5-inch rim, not previously recommended, identical with the present 4½-inch or F section rim, is included in the schedule, its width, between flanges, being halfway between the present 4½-inch or F section and the 5½-inch or G section rims. Its tire seat diameter will be the same as the present 36 x 5 (26 inches) and the rim will receive any 36 x 5 tire at present on the market or manufactured. The oversize, 37 x 5½ tire, can be used with this rim much better than with the old 36 x 5 narrow width rim.

A paper on "The Pros and Cons of Tire Inflation," prepared by Charles B. Whittelsey, secretary and factory manager of the Hartford Rubber Works Co., conveyed some important information on the functions of the pneumatic tire, showing how its efficiency as a shock-absorber was dependent wholly on its proper capacity and inflation, i. e., its interposition of a large enough and sufficiently resilient air cushion between the vehicle and the roadway. As promoting this condition the author favors the oversize tire.

The importance of proper inflation is referred to also from the standpoint of tire durability, a tire inflated to the right degree being not only less liable to punctures, blowouts and other tire troubles, but also protected against the excessive wear due to undue flexing, 12 or 14 per cent. of its sectional diameter being quoted as the maximum extent to which a tire should flatten at the point of contact, to give good service. There is, moreover, less heat developed in a tire of the right size and inflation, an important factor in its longevity. Tables showing the extent to which tires of various diameters should be inflated and the size of tire to be used for different loads, add to the practical value of this paper.

Another paper in which the manufacturer of rubber tires will be interested is by R. B. Mudge and deals with the object of "Wood Wheels vs. Wire Wheels." As a result of various tests made, the writer claims that the wood wheel, on account of greater resiliency, is more conducive to tire durability than the wire wheel. On the other hand, a paper entitled "Wire Wheels or Wood Wheels," treating in detail with the results of tests made with the two styles of wheels, by George W. Houk, is offered by the author as justifying a claim of 30 per cent. gain in service in favor of the wire wheel.

As the nature of the papers and reports above referred to will sufficiently show, the proceedings of the meeting were of a character to interest alike the automobile owner and consumer of rubber tires, their manufacturer and the student of automobile technology.

As a result of the general use of motor vehicles for transportation purposes in the war and the difficulty of keeping them shod with rubber tires, the spring wheel is finding extensive use. It is reported that one order from the German government called for more than 5,000 sets of heavy type spring wheels. Should the spring wheel make good, it will mean good news to the inventors and patentees of innumerable devices of this character.

Some American Automobile Tire Treads.



PENNSYLVANIA.



NO-RIM-CUT.



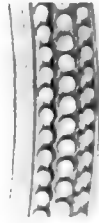
QUAKER CITY.



HENDRIE.



ARROW.



FISK.



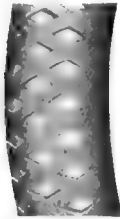
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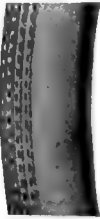
DAISY.



VACUUM CUP.



GLOBE.



KISMET.



TRUSTY.



EMPIRE.



SAFETY.



SQUEEGEL.



COUNTRY ROAD.



MILLER.



PUTNAM.



CONGRESS.



TYRIAN.



FIRESTONE.



BAILEY.



IMPERIAL.



W. M.



NOBBY.



KANT SLIP.



MAESTRI CROSS.



ZIG ZAG.



DAYTON.



NATIONAL.



PARAMOUNT.



INDIANA.



CAPITOL.



DEFIANCE.



GRIDWELL.



CONVERSE.



LYON.



BATAVIA.



SAVAGE.



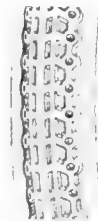
COG.



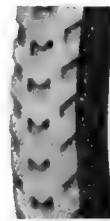
GORDON.



WORM.



MANSFIELD.



VACUUM BAR.



AJAX.



EMPIRE.



STAGGARD.



M. & M.



SPECIAL.



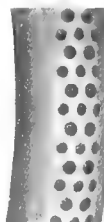
FALLS.



MATTSOIN.



HEMISPHERE.



DIMPLE.



SWINHART.



FALLS.



TRACTION.



CAR-SPRING.



MARATHON.



DREADNAUGHT.



PHARIS.



SECURITY.



RUGGED.



CHAIN.



BUCKSKIN.



BULL DOG.



VITALIC.

What the Rubber Chemists Are Doing.

BULLETIN No. 96 of the United States Hygienic Laboratory contains accounts of a number of analyses of rubber goods made to determine whether there were any substances present of a nature injurious to persons coming in contact with them. Nursing nipples were particularly examined. The report says: "Bearing in mind the conditions of the infant's mouth, it is undesirable that antimony be present. Lead, arsenic and mercury should be absent. Magnesium zinc and clay are less undesirable, and barytes are probably harmless." Antimony and Venetian red were noted, in addition to zinc oxide. No lead, arsenic or mercury were found. Generally speaking, the samples were found to be quite harmless.

DETERMINING THE CHEMICAL COMPOSITION OF CAOUTCHOUC.

C. Harries, of the University of Kiel, and Otto Lichtenberg, working quite independently, have been studying this question by producing halides with hydrochloric acid and regenerating the rubber by use of pyridine, then forming the ozonides. Various other compounds have been produced. Harries concludes from this and previous work (see "Berichte," Vol. 46, pages 733 and 2590; "Chemical Abstracts," 1914, page 260; "Journal of the Society of Chemical Industry," 1913, page 983; "Annalen," Vol. 406, 1914, page 173, and 1913, page 395; "Gummi-Zeitung," November, 1913, page 168; "Journal of the Society of Chemical Industry," 1913, pages 203 and 264; also "Chemical Abstracts" of 1913, pages 346, 1502, 1986 and 2860) that the theory of the 8 carbon ring must be abandoned and that raw rubber is not 1.5 di-methyl cyclo-octadiene, but that the molecule must be much larger, with at least 20 carbon atoms.

Lichtenstein seems to get about the same results ("Chemischer Zeitung," 1914, page 124). The work of both these authors is abstracted in "Chemical Abstracts," January 20, 1915, as is that of Caspari on osmosis, referred to in THE INDIA RUBBER WORLD, October, 1914, page 17. An abstract of an article on vulcanizing rubber shoes, from the "Gummi Zeitung," will be found in the same volume, and also a description of a friction testing machine by J. M. Bieber.

R. B. Rice has obtained Canadian patent No. 158,899 for vulcanizing under pressure. Later we refer to other patents along this line.

In the "Journal of the American Chemical Society" for December, 1914, page 2468, there is a record of studies by G. N. Lewis and M. Randal on "The Free Energy of the Various Forms of Sulphur." The article begins with the statement that "no other element is known to occur in so many forms as sulphur."

This seems to be largely made up of calculations based on the experiments of others, who are quoted. It will be of interest to those who are studying the functions of sulphur in vulcanization.

The January issue of the "Journal of Industrial and Engineering Chemistry" contains, on page 21, an article by Morris Weiss, of the Barrett laboratories, on "The Determination of Specific Gravities of Tars, Oils and Pitches." On page 34 is an article describing a method of determining the unsaponifiable matter in ether extracts. This was developed by the Texas experimental station.

SOME NEW PATENTS RELATING TO RUBBER.

David Spence, of Akron, Ohio, who assigns to The B. F. Goodrich Co., has received United States patent No. 1,122,653 for dyeing rubber. The claim is for "treating rubber with an aromatic amin in aqueous solution, then subjecting to a dye-forming bath." That is, the raw rubber is treated with aniline oil till some of the oil has been absorbed; then, by use of nitrites, the aniline is fixed on the fibre, and when treated with betanaphthol-sodium salt, for example, will develop a blood-red

color. Recently (THE INDIA RUBBER WORLD, November, 1914, page 67, and December, 1914, page 130) comprehensive patents for the use of coal tar dyes have been granted Beyer & Co.

Lewis Carter Warner, who assigns to the Beacon Falls Rubber Shoe Co., of Beacon Falls, Connecticut, has received United States patent No. 1,122,824, which claims the vulcanization of rubber shoes by subjecting them first to a vacuum, then to pressure, and afterwards vulcanizing. Quite recently (THE INDIA RUBBER WORLD, November, 1914, page 95) a patent was issued which comprised a system of vulcanizing under vacuum.

Herbert W. Kugler, of Akron, Ohio, who assigns to the Firestone Tire & Rubber Co., has obtained United States patent No. 1,124,920 for a process of reclaiming rubber, which consists in heating under pressure with alkali and aniline (THE INDIA RUBBER WORLD, October, 1913, page 37, and August, 1914, page 622).

Leo Dart, who assigns to the Electro-Chemical Rubber & Manufacturing Co., has obtained United States patent No. 1,120,795 for rubber-coated articles and method of producing the same. The essence of the invention seems to be in putting bismuth or its alloys on the surface of the metal, which allows the rubber to be vulcanized thereon. In United States patent No. 1,120,794 the same inventor makes the above claims for antimony.

Otto Rohm, of Darmstadt, has obtained United States patent No. 1,121,134 for process of making rubber substitute, which consists in vulcanizing any acrylic acid ester.

ANALYSIS OF RUBBER.

In the November, 1914, issue of the "Chemical Engineer," the methods used by the Armour Institute of Technology for the analysis of rubber are detailed in full.

The analysis of raw rubber is first taken up and the sampling methods used are described. While it is recommended that large samples be made by mixing a great number of small samples taken from various parts of the whole lot, no definite process of procedure is outlined.

Moisture: The rubber is dried in a vacuum desiccator over sulphuric acid, with weighings extending over several days, but it is recommended that for technical work, drying in a stream of gas be used, notwithstanding that gas is absorbed by the rubber to some extent. It is maintained that concordant results are what is required rather than absolute exactness.

Estimation of Resins: This is made by acetone extraction in a modified Wiley-Soxhlet apparatus, first wrapping the samples in cheese-cloth in which it is afterwards weighed after five hours' drying at 90 degrees C. in hydrogen. The extract, after driving off acetone, is saponified. The unsaponifiable matter is extracted in a separatory funnel with ether. The ether extract of unsaponifiable matter is dried and taken up in alcohol, and the waxy hydrocarbons are frozen out with ice and salt. They are dissolved in chloroform, dried and weighed. This is called the resins.

Determination of Insoluble Matter: A sample of one-half gram to one gram is weighed and dissolved in a graduated cylinder with benzol in about two days. The solution is made up to 200 C. C., and after settling, an aliquot part of solution is taken off, evaporated to dryness and weighed. The difference between this weight and the same proportion of the original sample represents the same proportion of insoluble matter which is thus calculated and determined.

Nitrogen: This is determined by the ordinary Kjeldahl method.

Estimation of Ash: Gentle incineration in a muffle is used, the residue being weighed. By examining the ash some conclusions can be drawn as to the origin of the rubber.

ANALYSIS OF MECHANICAL RUBBER GOODS AND RUBBER INSULATION.

Ash: After an acetone extraction the residue is gently ignited and weighed, making no corrections for the sulphur. This is much simpler than the method recommended by the Joint Rubber Insulation Committee ("Journal of Industrial and Engineering Chemistry," January, 1914, page 74). They dissolve the residue in Terebene and xylol and filter through tared filter paper which is then weighed without incineration.

Total Sulphur: The sample is treated with nitric acid saturated with bromine and evaporated to dryness and fused with potassium nitrate and sodium carbonate. The sulphate thus formed is determined as usual.

Acetone Extraction: This is performed in a modified Wiley-Soxhlet extractor with a sample wrapped in extracted and weighed cheese-cloth, as before described. The residue in the

cheese-cloth is dried in a hydrogen gas current for five hours, and the loss of weight is called "acetone extract uncorrected." Saponification and freezing are performed as in crude rubber determination above. The product is called "waxy hydrocarbons." It is evident that any rubber resins present would thus be called "waxy hydrocarbons." Sulphur is determined in the saponified matter as sulphate. The above method is practically identical with that recommended by the Joint Rubber Insulation Committee referred to above. But the committee makes a further separation into cases "A" and "B."

Rubber: The sum of the corrected acetone extract, ash, total sulphur and waxy hydrocarbons, is subtracted from 100, and the difference is called "Rubber by Difference."

A comparison of these methods with those recommended by the United States Bureau of Standards may be made by referring to THE INDIA RUBBER WORLD, December, 1914, page 129.

A Review of Recent Progress in Rubber Chemistry— I.

Contributed.

The author of this paper, a well known rubber chemist, submitted it, not as in any way a descriptive article, but merely as an index of progress during the last two years. To elaborate it and make it a readable article would necessitate the use of many hundreds of pages.

DURING the last few years there has been considerable progress in the chemistry of rubber, though there have been no striking discoveries which have greatly changed rubber manufacture or been of marked commercial importance. Perhaps one reason for this has been the fluctuation of price in rubber itself and the commercial changes attributable to the rapid advance in the use of plantation brands, together with the lowering of price and disappearance of many brands of rubber.

As an instance of this may be cited the immense amount of work and money spent on synthetic rubber research while the price of Para was around \$2 per pound. Another instance is the partial disappearance of the deresinating industry, owing to the increased price of crude pontianak and scarcity of other brands of low grade crude.

The notable book by C. O. Weber, published in 1902, gave English readers the first classified work on the theory and practice of rubber chemistry, though much had been published before in a desultory way. Since that time general chemistry has advanced. Colloid chemistry particularly has received much attention, and, as rubber is one of the best examples of a colloid, this advance has helped rubber chemistry.

COLLOID CHEMISTRY.

Since the publication of the work entitled "Colloids and the Ultra-microscope," by R. Zsigmondy, and translated into English by Jerome Alexander, this subject has received much attention, especially as the invention of the ultra-microscope has enabled us to actually see the colloid groups. One of the latest contributions on this subject from an American authority, Dr. Wilder T. Bancroft, is a paper prepared for the meeting of the American Chemical Society which was to have taken place in Montreal in August. In this he gives a working theory for colloid chemistry which may be summarized as follows:

1. Colloid chemistry differs from ordinary chemistry only through the variation resulting from the increasing dispersity of one or more phases.

2. Selective absorption occurs at the surfaces.

3. Sufficiently finely divided particles which are prevented from coalescing will be kept suspended by the Brownian movement.

4. Under fixed conditions of peptonization, we get an approximately definite limiting concentration corresponding with a saturated solution in the case of a true solution. ("Journal of Physical Chemistry," 1914, Vol. 18, p. 549.)

P. Bary ("Journal of Physical Chemistry," Vol. 10, p. 437) states there are two strict divisions of colloids: Those having the power to form gels on account of their great cohesion and power to dissolve. These are properly so called. Second, electrical suspensions. In the case of gels, the conversion into miscellæ is obtained at a specific increase in volume, independent of the nature of the solvent, which may be benzol, chloroform, etc.

In another article this author (*Ibid.*, No. 3) states, "benzene penetrates slowly, passing by osmosis into the particles."

OSMOSIS AND SWELLING IN SOLVENTS.

Some recent work has been done along this line. W. A. Caspari read a paper before the London Chemical Society in which the osmotic properties and physical constants of rubber solutions are described. (THE INDIA RUBBER WORLD, October, 1914, p. 17.)

F. Kirchof (THE INDIA RUBBER WORLD, October, 1914, p. 17) has made a thorough investigation on the swelling of vulcanized rubber.

VISCOSITY.

At the Eighth International Congress of Chemistry, J. G. Fol, of Delft, presented a paper on the relation of viscosity to the amount of resins in Castilloa rubber (Vol. 9, Report of the Eighth Congress). This paper was discussed there (*Ibid.*, Vol. 27) by E. Marckwald, F. H. Hinrichsen, Eaton and others. Clayton Beadle and Stevens later discussed this subject. (THE INDIA RUBBER WORLD, October, 1914, p. 18.) P. Schidrowitz ("Chemical Abstracts," Vol. 13, p. 3669) has further contributed to our knowledge of this subject. R. Gaunt (THE INDIA RUBBER WORLD, August, 1914, p. 600) has also taken up the subject of the viscosity of solutions. F. Kirchof ("Kolloid Zeitung," 1914, Vol. 15, p. 30) has made a study of the influence of the solvent on the viscosity of rubber solutions.

In general the viscosity coefficients, it is found, run parallel with the numbers which form a measure of the swelling capacity of the various solvents toward caoutchouc. Solutions in haloid compounds, such as carbon tetra-chloride, tetra and penta-chlor-ethane, have twice the viscosity of benzol or petroleum benzene solutions. Spence and Kratz (THE INDIA RUBBER WORLD) have also contributed to this subject. B. J. Eaton ("India Rubber Journal," August 16, 1913) has made some investigations on viscosity. It may be noted that most of the workers

on rubber solutions prefer to use the Ostwald viscosimeter, which is so little known in America that the dealers in laboratory supplies neither illustrate nor catalog it.

CONSTITUTION OF THE RUBBER MOLECULE.

F. E. Barrows ("Armour Engineer," March, 1913, p. 169) has a thesis on the theoretical structure of the rubber molecule. This article has attracted much attention in Europe. Ditmar ("Kolloid Zeitung," July, 1913) gives four pages to a review of this article.

Hilden had very early shown that isoprene was methyl divinyl, as quoted by Weber, but several years ago Harris ("Berichte," Vol. 38, pp. 1195 and 2590), after a thorough investigation, concluded that the rubber molecule was 1,5, di-methyl-cyclo-octadien, 1,5, which may be regarded as two molecules of isoprene united by their double bonds, forming the 8 carbon ring. In the "Annales de Chimie," 1913, p. 395, and "Berichte," Vol. 40, p. 733, work is described on the halides and hydro-halogenides and ozonides, from which conclusions are drawn as to the above 8 carbon ring and the differences in construction between the artificial rubbers and the natural rubbers. ("Journal of the Society of Chemical Industry," 1913, pp. 203, 264, 372 and 983; and "Chemical Abstracts," p. 2862.)

W. Caspari (THE INDIA RUBBER WORLD, April, 1914) has written on the composite nature of crude rubber. Quite recently ("Annales de Chimie," Vol. 406, 1914, p. 173; "Chemiker Zeitung," No. 21, p. 1239, and "Gummi Zeitung," November 3, 1914, p. 168), Harries has contributed articles on the constitution of caoutchouc and allied compounds. Lichtenberg ("Gummi Zeitung," November 13, 1914, p. 168) has studied the conversion products of the hydro-halogenides of caoutchouc and their thermal dissociation.

THE NATURALLY ACCOMPANYING SUBSTANCES IN CAOUTCHOUC.

When Weber wrote his work it was recognized that resins, ash and nitrogenous matters always accompanied rubber and the influence of the resins was recognized, but the idea that the insoluble portion described was of any influence was scouted on account of its small quantity.

At the Eighth International Congress of Chemistry L. E. Weber read a paper showing that the extraction of resins greatly interfered with the vulcanization of rubber. (Vol. 9, p. 95, Report of the Eighth Congress.) Clayton Beadle and H. P. Stevens discussed this (*Ibid.*, Vol. 25, p. 581) and confirmed Weber's statements. G. H. Savage also commented on this subject (*Ibid.*, Vol. 27, p. 71) and discussed the effect of litharge.

THE INSOLUBLE CONSTITUENTS OF CAOUTCHOUC.

Since the time above referred to the nature of the insoluble constituent has been studied and its influence determined with some degree of accuracy. Beadle and Stevens (THE INDIA RUBBER WORLD, May, 1914, p. 400) have shown its influence. In the "Journal of the Society of Chemical Engineers," December 16, 1913, there is a full account of their experiments. W. Caspari, as cited above (THE INDIA RUBBER WORLD, April, 1914, p. 340), has shown that the pectous portions are stronger than the non-pectous portion. Newton W. Barritt, of the International Institute of Agriculture at Rome, has lately (THE INDIA RUBBER WORLD, June, 1914, p. 507) discussed the proteins of rubber.

Spence and Kratz have in connection with studies on viscosity (THE INDIA RUBBER WORLD, October, 1914, p. 18) isolated the insoluble constituents and determined the amount of nitrogen therein and described the isolation and characterization of the soluble constituents. G. Bernstein (THE INDIA RUBBER WORLD, November, 1914, p. 68) criticizes their work, claiming it is not novel in methods used. Marguis and Heim (THE INDIA RUBBER WORLD, November, 1914, p. 68) in the "Bulletin of the Society of Chemistry," 1913, p. 862, have also worked on this problem. W. Schmidt has also contributed to this subject. ("Journal of the Society of Chemical Industry," 1913, p. 499.)

RESINS.

Some years ago the deresination of rubbers such as pontianak and guayule was carried on in the United States to a considerable extent and the resins from them attracted quite a little attention as possible substances for use in various arts (THE INDIA RUBBER WORLD, May, 1909, p. 277). At that time little was known as to the chemical composition of these resins, though they had been experimented on considerably for industrial use. We referred above to the part these resins were supposed to play in vulcanizing. Since that time views have changed in many cases. Of late several researches have been conducted upon these resins to determine their chemical composition.

M. Klassert ("Zeitschrift Analytischer Chemie," Vol. 26, p. 471) has conducted quite an extensive research on samples of resins from America, and while he does not seem to know where they came from it is evident from the description that they were extracted resins from pontianak and guayule. The pontianak resins were both the granular kind, as extracted, and the same resins fused.

G. Hillen ("Archives de Pharmacie," 1913, p. 94) gives results of a fairly thorough analysis of pontianak and other resins. The subject of the relation of resins to vulcanization was discussed at the Eighth International Congress of Chemistry by L. E. Weber, Beadle and Stevens (Vol. 9, p. 71, Report of the Eighth Congress), J. G. Fol also gave the results of experiments to determine the relation between the amount of resins and viscosity. E. Marckwald (*Ibid.*, Vol. 28, p. 69) stated that according to his experiments there was no relation between the viscosity and the amount of resins in Manihot rubber. F. W. Hinrichsen also took part in the discussion, and G. H. Savage (*Ibid.*, p. 71) gave results of vulcanizing with resins and litharge.

LATEX AND COAGULATION.

When the main portion of rubber used in commerce and manufactures was produced from wild trees and vines the subject of coagulation of the latex or anything connected with the latex received very little attention from chemists. The production of the rubbers was usually so far from civilization and the transportation and preservation of latex to a point where the chemist could be reached was so difficult that little progress in its study was made. At the Eighth International Congress of Chemistry (Report, Vol. 9, p. 39) Clayton Beadle and H. P. Stevens made a long report on work on latex which had been preserved and sent to England. They concluded that latex preserved with ammonia would, after dialysis, behave similarly to fresh latex. Coagulation, they believed, whether partial or complete, is brought about by the action of acid-reacting substances on the free globules only. They state that 0.15 per cent. acetic acid will completely coagulate freshly dialyzed latex.

In part 2 of their paper they give complete analyses of latex.

COAGULATION.

The Para rubber gatherers developed without the help of chemists a very good system of coagulating latex, and rendering it antiseptic, merely by their crude smoking methods. The modern chemist has succeeded in pointing out to the plantation manager how he can get the same effect with practically the same substances applied by more modern methods. Modern coagulation by acetic acid is following the same lines as the *seringueiro* with his smoke. The acetic acid used by the plantation manager is made primarily from wood smoke. In addition, it is becoming common to produce smoked sheet.

Sidney Morgan (THE INDIA RUBBER WORLD, December, 1913, p. 147) with Clayton Beadle and Stevens have given results of many experiments in methods of coagulating and drying crêpe and their effects on the product. They found that in all cases the use of sodium bi-sulphite improved the rubber and made pale crêpe.

M. V. Cayla (THE INDIA RUBBER WORLD, December, 1913, p. 118) has recently given a long description of the Brazilian system of smoking to produce coagulation.

Newton W. Barritt, in the "Journal of the Society of

Chemical Industry," 1914, p. 289, and THE INDIA RUBBER WORLD, August, 1914, p. 600, have very thoroughly treated this subject. They conclude that acid and salts are both necessary, but there are some salts in the latex.

M. Vernet (THE INDIA RUBBER WORLD, October, 1913, p. 14) in discussing this subject says there are difficulties in using both acids and salts for coagulation, but advises their use. B. J. Eaton says that 0.1 gr. of acetic acid to 100 C.C. of latex is sufficient ("Journal of Society of Chemical Industry," 1913, p. 1097). A. E. Berry has received British patent No. 16,728, of 1913, for coagulating latex with one-tenth per cent. of 5 per cent. solution of sulphurous acid. S. C. Davidson has received British patents No. 13,438 and No. 20,183 of 1913, and No. 764 of 1914 for coagulating by the use of creosote (THE INDIA RUBBER WORLD, December, 1914). Byrne has applied to the German patent office for patent on using wood vinegar for this purpose.

Schidrowitz and Goldberg ("India Rubber Journal," Vol. 44, p. 1147) after experimenting very thoroughly find that the less acid used in coagulating the better the quality of the rubber. F. Kaye has shown ("India Rubber Journal," 1913, p. 1297) that the acid combines with proteins in vulcanization.

The Rubber Planters' Association ("Planters' Chronicle," August 25, p. 628) has recently had extensive experiments made on the production of acetic acid for coagulating and investigated other substances. It is claimed that the slightest trace of copper in the acid is fatal to coagulation work, as it produces a slimy coagulation and a worthless product, and great care is exercised to obtain acid free of copper. Toddy vinegar, bi-sulphate (not sulphite) of soda, formic and lactic acid are recommended, and if unobtainable, sulphuric acid is allowable. Alum is said to be much used by the natives for coagulating. Eichelbaum received German patent No. 256,904 and addition No. 254,196 for preserving latex with sulphy-silicate compounds and formaldehyde and later for using hydrosulphites.

(TO BE CONTINUED.)

THE ANALYSIS OF MATERIALS USED FOR ELECTRICAL INSULATING PURPOSES.

THE criticism of the report of the Analytical Committee of the American Chemical Society, in connection with its work in analyzing materials used for electrical insulating purposes, by the Joint Rubber Insulation Committee, elicited the following reply from the first named body, which we reprint in full from the "Journal of Industrial and Engineering Chemistry," December, 1914:

"From the reply of the Joint Rubber Insulation Committee, this journal, 6, 515, it is evident that some discussion of the results as published in this journal, 6, 514, is necessary to prevent any misunderstanding as to their bearing. Since this reply appeared it was impossible to hold a meeting of the Analytical Committee until this date.

"In presenting the results of their work, the Analytical Committee voted to confine their published report to the facts brought out by their analysis and omit all discussions, as a publication of these discussions in full would have occupied more space than this committee could reasonably have asked for and it was by no means certain how much of it would be of general interest.

"The three compounds selected for analysis were designed to test the accuracy of the methods for analysis of the Acetone Extract as affected by the presence or absence of the two hydrocarbons used in commercial practice. The amount of rubber and the fillers were varied only slightly to avoid the influence of extraneous factors on the results. The selection of fillers and the respective proportions were designed to fall within the limits prescribed by the 1913 Railway Signal Association's specification for 30 per cent. fine Para insulation, as this was considered

to be the most important type of material to which the methods of the Joint Rubber Insulation Committee were likely to be immediately applied. The methods of the Joint Rubber Insulation Committee were intended to be applicable to the analysis of just such compounds. Therefore, if the errors have been magnified due to the constituents, the methods should be revised to meet such conditions.

"The Analytical Committee, before issuing its report, took into consideration the discrepancies of analyst No. 3 under waxy hydrocarbon, which in all probability were due to the solution of alcoholic potash used. They also took into consideration the results of No. 4, under free sulphur, which were obtained by the use of a different type of extractor, for comparative purposes. Inasmuch as no conclusions drawn from either of these results were adverse to the methods of the Joint Rubber Insulation Committee, no exception was made to the decision of the committee to publish only the results and conclusions.

"These discrepancies and the reasons for the same were brought to the attention of the Rubber Section at the Cincinnati meeting and were fully discussed at that time. Two members of the Joint Rubber Insulation Committee, who were instrumental in drawing up the comments printed in this journal, 6, 515, were present at this meeting and were fully acquainted with the facts.

"A clerical error which appeared in the published report should be corrected as follows: Under Sample A, Analyst 1:

11/20—Total waxy hydrocarbons should read 2.14 per cent.

11/21—Total waxy hydrocarbons should read 2.55 per cent.

"Referring to the comments on the work of Analyst No. 2, the Joint Rubber Insulation Committee state: 'The results indicate that the Acetone Extraction was not properly made.' Comparison of the results of Analyst No. 2 with those of Nos. 1, 4 and 5, which are taken as a standard for comparison, does not substantiate this statement, as these results are consistent with Nos. 1, 4 and 5 and the duplicate results are particularly consistent; furthermore, the analyst states that the Acetone Extraction was made absolutely in accordance with the procedure.

"The fact that the averages of a large number of determinations are 'about what we would expect from this compound' proves only that positive and negative errors are equally probable and does not substantiate the claim that the determination of saponifiable extracts by this method will give accurate results, since the individual results show that the probable error of a single determination is large.

"This procedure is given as a method for 30 per cent. *Hevea* rubbers, therefore the Analytical Committee was justified in making its first investigation on fine Para."

E. W. BOUGHTON, W. A. DUCCA, G. H. SAVAGE,
J. B. TUTTLE, P. H. WALKER, D. W. WHIPPLE, *Chairman*,
114 Liberty street, New York City, November 16, 1914.

BISULPHITE NOT BISULPHIDE.

In reporting the remarks made by Mr. Henry P. Stevens at the International Congress of Tropical Agriculture, in the November number of THE INDIA RUBBER WORLD, the speaker was made to say that he used small quantities of sodium bisulphide in the manufacture of pale crêpe plantation rubber. This was an error; the chemical used by Mr. Stevens was bisulphite of sodium.

The introduction of sodium bisulphite as an antiseptic in the treatment of rubber latex in the East was due to Mr. Sidney Morgan, the resident chemist of the Rubber Growers' Association Malaya Research Fund. Samples so prepared were carefully tested, and the use of this substance has now become practically universal in the preparation of pale crêpe rubber.

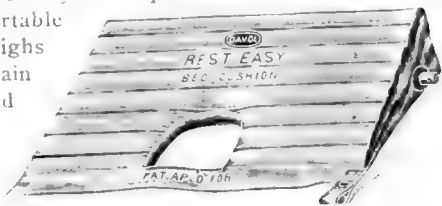
Announcement has been made by steamship lines operating to South Africa of a reduction in the surcharge on freight to 15 per cent., the old rate having been 20 per cent.

New Rubber Goods in the Market.

RUBBER GOODS FOR THE INVALID

HERE are shown cuts of two new additions to the already long list of rubber articles provided for use in the sick room.

The first is the Easy non-slip bed cushion, a device which provides a comfortable support to the thighs and relieves all strain on the spine and abdominal muscles when the patient assumes a sitting position.



It is also adapted for use in bed for reading, writing or eating. It is also adapted for use in wheel chairs and, in combination with a back rest, it gives the required position for post operative work.

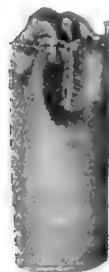
It is 14 x 20 inches in size and is made of pure gum, cloth inserted.

The second is a new style of bed pan, especially constructed both for comfort and service. It is made of fine maroon, cloth inserted, stock, providing a soft inflated cushion for the spine, which is not raised from the bed as is required in the use of the ordinary bed pan. Its generous capacity makes it also suitable for douche purposes. [Davol Rubber Co., Providence, Rhode Island.]



RUBBER TRAVELING ACCESSORIES.

Here are shown several accessories which materially decrease the discomforts of travel. One is a bag for shoes or rubbers, made of leather and having a rubber lining. It is about a foot long and just the thing to protect the other contents of the bag or trunk from the shoes and rubbers, while also protecting the shoes from scratches.



The other cut shows a folding wash basin, made of rubber. This basin is 11 inches in diameter and will fold up—including the soap box and wash cloth in its rubber case—into a space 6 x 8 x 2 inches. [Daniel Low & Co., Salem, Massachusetts.]



SUCTION GRIP FOR LADDERS.

An interesting and useful device is the Morrison Safety Suction Grip, consisting of a small cell-filled piece of rubber, fitted in an iron casting and intended for attachment to either end—or both—of a ladder, to prevent slipping. Another purpose is to render ladders so equipped harmless to the most delicate or highly polished surfaces. This suction foot is made for ladders of every size and the rubber suction grip pad may be readily renewed in the casting. [The Morrison Safety Ladder Foot Suction Grip Co., Lowell, Massachusetts.]

THE "LE ECONOMY" ELASTIC HOSIERY

One great trouble with elastic hosiery is the effect that perspiration has on the rubber thread contained in it. Of necessity this thread is made of almost pure rubber, and is therefore easily affected by perspiration acids. The "Le Economy" hosiery is a new weave which is designed to remove this trouble. Each piece, whatever the application is to be, is knitted separately to a form and with a scientific knowledge of equally divided pressure. [Lee Tire & Rubber Co., Conshohocken, Pennsylvania.]



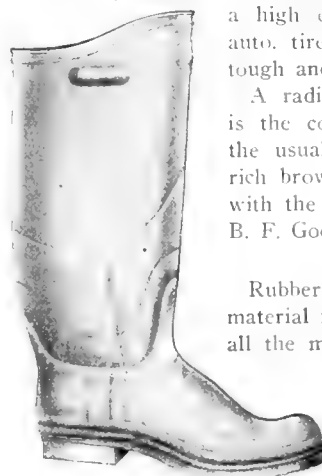
PANTHER SOLES.

The "Panther" guaranteed fibre rubber sole is one of the newer substitutes for sole leather. It can be easily attached, and the makers' guarantee, under proper treatment, against cracks, breaks or tears in use, covers not only the soles but the cost of the shoes to which they are attached. [Panther Rubber Manufacturing Co., Stoughton, Massachusetts.]

HIPRESS FOOTWEAR.

These goods are cured under pressure instead of in open dry heat. They are called "Little Brothers of the Goodrich Tire"—a high compliment. They are made of auto. tire stock, which of necessity is as tough and durable as can be made.

A radical departure from the ordinary is the color of these boots. Instead of the usual black, they are made either a rich brown or a cream-white, and always with the red border about the top. [The B. F. Goodrich Co., Akron, Ohio.]



"SHEDWET."

Rubber leather, or "Shedwet," is a new material for resoling shoes, said to possess all the merits of both rubber and leather besides a few exclusively its own. It is about the same weight as leather, compared with which it costs a trifle less and is more resilient, is water-

proof and will not slip or skid. It is made in black and tan and with plain and corrugated treads. [Essex Rubber Co., Inc., Trenton, New Jersey.]

NEW SPORT SHOES.

The "Anatomik" is a new straight last golf shoe having a special adaptation to conform to the arch of the foot. It is made for both men and women, the men's style being made in brown ooze-finish leather and the women's in russet chrome, both with rubber heel and sole, the latter having a leather tip. [John Wanamaker, New York.]



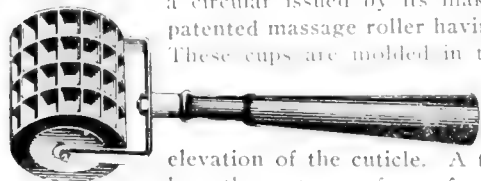
The other sole is for tennis shoes. It is an English non-slip rubber sole on the vacuum idea, and the line on which it is in use embraces both men's and women's sizes. [Frank L. Slazenger, New York.]



A factory has been established at LaCrosse, Wisconsin, by William P. Armstrong, for the manufacture of fighting dummies similar to those illustrated and described in the new goods section of our November issue.

A NEW MESSAGE ROLLER.

Many varieties of rubber massage rollers have been introduced from time to time, but here is a new one, described in a circular issued by its maker as "the only patented massage roller having suction cups." These cups are molded in the rubber, their action causing successive depression and elevation of the cuticle. A tube of soft rubber, the outer surface of which is covered with these suction cups, is placed over a hardwood cylinder. A hardwood handle and mountings complete the roller, which is operated by hand. [M. Stonebridge, 4143 Park avenue, New York.]



DRESS SHIELDS AND RUBBER BIB.

A new line of dress shields being produced under the brand "Omo-Elva" contains two distinctive styles worthy of note.

The first of these is a shield of regulation shape, the portion that extends under the arm having attached to it a net upper in the form of a short sleeve. This sleeve has an elastic band around the top to hold it in place over the shoulder, making it easy of adjustment.

The second is the sew-on type of shield, having a small pocket attachment for sachet. This new line is made of pure rubber, double covered with fine absorbent nainsook.

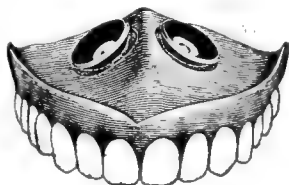
The plain rubber bib has saved many a small child's dress from spots and stains that would have gone through a bib of the ordinary variety—but usually at the expense of some other article, the carpet, for instance, the milk, jelly or crumbs rolling off the bib on to the floor. The waterproof bib with a cover of absorbent material that can be detached and cleansed—which followed the plain rubber sort—absorbs liquids, but does not prevent crumbs from falling on the floor. But the latest bib, just introduced, is an improvement on all

its predecessors, having a pocket that catches all droppings and protects both the clothes and the floor. It is made of rubber and can be washed easily. [The Omo Manufacturing Co., Middletown, Connecticut.]



DENTAL SUCTION CUPS.

Rubber suction cups for dental plates are now being offered, in sets, for either upper or lower plates. One feature of these suction cups is that they are renewable and may be applied or taken off the plate by the wearer in a moment. They are said to be of great assistance in difficult plate adjustments. [Eureka Suction Co., Loudonville, Ohio.]

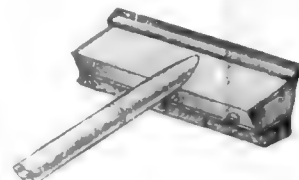
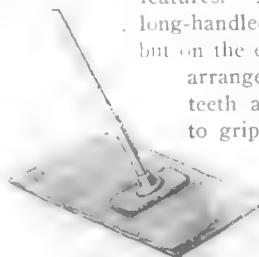


An ingenious device to remove rain, sleet or snow from the front window of a trolley car or other moving vehicle is the rubber-edged squeegee. This is so arranged that it may be easily moved by turning a handle within convenient reach of the motorman or driver, a metal rod holding the rubber edge of the squeegee firmly against the window.

HOUSEWORK HELPS OF RUBBER.

These several cuts represent the successful carrying out of ideas to relieve housework of a few of its many disagreeable features. The first is an improvement on the long-handled mop. It retains the long handle, but on the end of this there is a toothed crossbar arrangement which resembles a rake. These teeth are made of rubber and are intended to grip the cloth and guide it over the surface to be scrubbed.

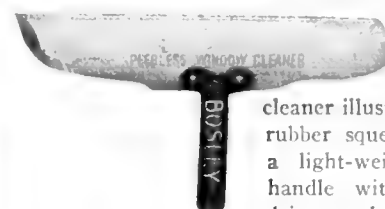
Another device, combining water



pail, sponge and drying cloth, is for use in washing windows. This also has a long handle being intended for use on the outside of the window. A shallow reservoir of metal with a sponge at

one side and a rubber "squeegee" on the other is attached to the handle.

The Peerless window



cleaner illustrated is another rubber squeegee. This has a light-weight sheet steel handle with an improved drip catcher, the cleaner

portion being made of hard wood with a rubber strip. [The D. W. Bosley Co., Chicago.]

The fourth cut shows a Japanned sink scraper with rubber edge. Messrs. Takito, Ogawa & Co., of 325 West Madison street, Chicago, are manufacturers and importers of this class of goods.



FUR-LINED MACKINTOSH.

The British manufacturers of mackintoshes are adapting their lines to the needs of the soldiers in the field, and the coat illustrated is one of the latest styles evolved. There is nothing in its general appearance to indicate that it differs from the ordinary. It is different, however, for while cut on the lines of the regulation officer's mackintosh, it has a fur lining, the one garment serving the purposes of mackintosh and overcoat. [Debenham & Freebody, London, W., England.]



The British government has appointed an emergency committee to consider prevention of gun-deafness among soldiers and sailors, the incessant report of guns often causing rupture of the drum membrane. In the French, Japanese and American armies mechanical contrivances are employed to prevent this condition, the American soldiers being provided with a vulcanite device having celluloid ear stoppers.

A new employment for insulated wire is in the propulsion of a scrubbing machine. This is a small push cart apparatus operated by levers on the handle. These levers control a supply of water from a tank, powdered soap, a set of brushes which revolve on the floor, and a pump which sucks up the dirty water as the cart is pushed ahead. The power is supplied through a wire cable connected with a lamp socket.

It is now possible to administer anesthetics at body temperature, thus insuring greater safety to the patient and more rapid and satisfactory absorption. This is effected by the insertion in the rubber inhaler tube of electric wires which heat the vapor before it passes into the inhaler. [The S. S. White Dental Manufacturing Co., Philadelphia.]

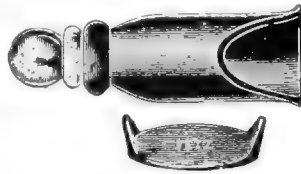
A VACCINE TUBE WITH RUBBER BULB.

A new vaccine tube point has been introduced, as herewith illustrated. This tube is made of one piece of glass, easily sterilized, within which the virus is hermetically sealed. When it is desired to use the vaccine a rubber bulb is pushed over the small end of the tube, until the end of the tube projects through the bulb; the flesh is scarified with the point of the tube, but no blood is drawn, and the tube is broken off inside the bulb, through the end of which the broken part is removed. Then the point of the tube is broken off, and the virus is expelled by means of the rubber bulb directly on the scarified area, into which it is rubbed. [H. K. Mulford Co., Philadelphia.]

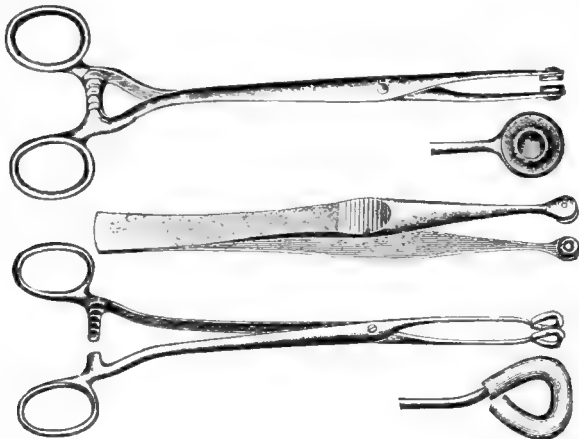


RUBBER IN MEDICAL AND SURGICAL WORK.

The first of the illustrations below shows the Pleximeter, a hard rubber instrument for use in making diagnoses, for detecting any abnormal condition in a given portion of the body, and especially in sounding cavities of the chest.



The other illustrations show forceps such as are used in intestinal operations. The ends of these forceps have soft rubber tips, which prevent the crushing of the intestines while being brought up in the field of operation. These rubber protections enable the operator to bring



sufficient tension to bear to hold the intestine at any desired point without the laceration liable to result where the ordinary steel instrument is used. [Frank S. Betz Co., Hammond, Indiana.]

MOTOR DRIVEN FIRE EQUIPMENT SUPPLANTS THE HORSE.

The Fire Department of New York has asked an appropriation of \$308,000, to be used in converting the present horse-drawn fire apparatus to motor driven, and for the purchase of new apparatus. The city's present equipment comprises, besides its horse-drawn vehicles, 271 pieces of motor apparatus, 228 motor vehicles having been substituted in the past three years. The present fire commissioner, Robert Adamson, is an advocate of motor apparatus, his preference being based upon greater efficiency, on account of quick response to third and fourth alarms, where a uniformly high rate of speed for distances of perhaps 8 or 10 miles is impossible with horses employed on vehicles weighing from 11,000 to 17,000 pounds; also on the saving in cost and maintenance and in quarters for the department apparatus. If this appropriation is granted by the end of 1917 the city's entire equipment will be of the motor class.

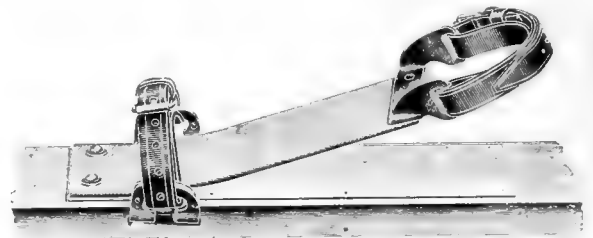
TOY BALLOONS.

The toy rubber balloon with self-closing valve is a distinct improvement over the ordinary variety. Easily inflated, it can be deflated with equal facility, simply by inserting a small stick in the neck of the balloon and holding there until the air escapes, to relieve the strain of inflation when not in use. Such balloons are obtainable in a variety of colors and are adapted for and much in use in many kinds of lawn and indoor games, in addition to their popularity as a children's toy. The cuts show a new cigar-shaped balloon supplied with this valve and which, by the addition of a stick and a colored tissue tassel, becomes a pom-pom balloon, or, by the addition of a paper pin wheel attached to a cork inserted in one end and a string tied to the other, becomes a toy airship. This balloon is made in assorted colors and inflates to 14 inches in length and 4½ inches in diameter. [Gregory Rubber Co., Akron, Ohio.]



BALATA SKI BINDING.

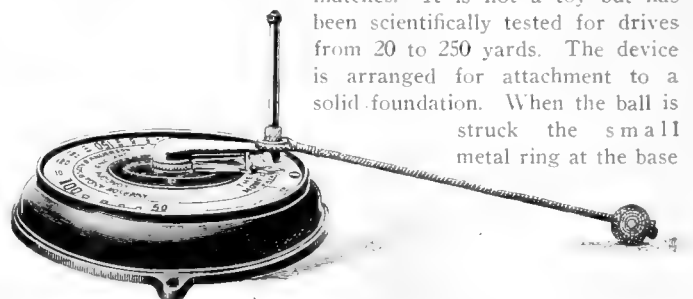
While skiing is not the popular sport here that it is in the Scandinavian countries, where it originated, still, in the colder sections and in Canada it has become a popular winter pastime and the ski constitutes quite an item in the sales of the sport-



ing goods dealers. One of the most important features in the manufacture of the ski is the binding, the balata binding as illustrated above forming one of the varieties most in use. [G. S. Sprague & Co., Boston.]

THE HOME GOLFER.

The accompanying illustration shows a new golf machine, the "Varsity" Home Golfer, patented and produced by a rubber goods manufacturing firm and suitable for parlor or lawn matches. It is not a toy but has been scientifically tested for drives from 20 to 250 yards. The device is arranged for attachment to a solid foundation. When the ball is struck the small metal ring at the base

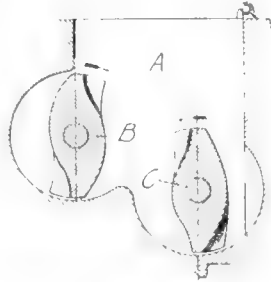


of the upright spindle to which the golf ball is attached, by its movement on the spindle, indicates whether the ball would have flown high or low—whether or not it would have cleared the bunkers, etc. The force of the stroke moves forward the upright spindle and the crank to which it is attached, thus moving the indicator on the dial and registering the force of the drive. It is said to have been introduced on several ocean liners. [Anderson, Anderson & Anderson, Limited, London, England.]

New Machines and Appliances.

KEMPTER'S MIXER.

THE illustration shows an end elevation in section of a novel mixer or grinder. The trough, which is supported by side frames (not shown), has a hinged section on the right for removing the charge. The two kneaders are journaled in bearings and are driven towards each other in the direction indicated by the arrows. These rolls mix the rubber and compounding ingredients automatically, with a grinding and kneading action, the mass being drawn between the kneaders and the circular walls of the trough. [German patent No. 279,649.]

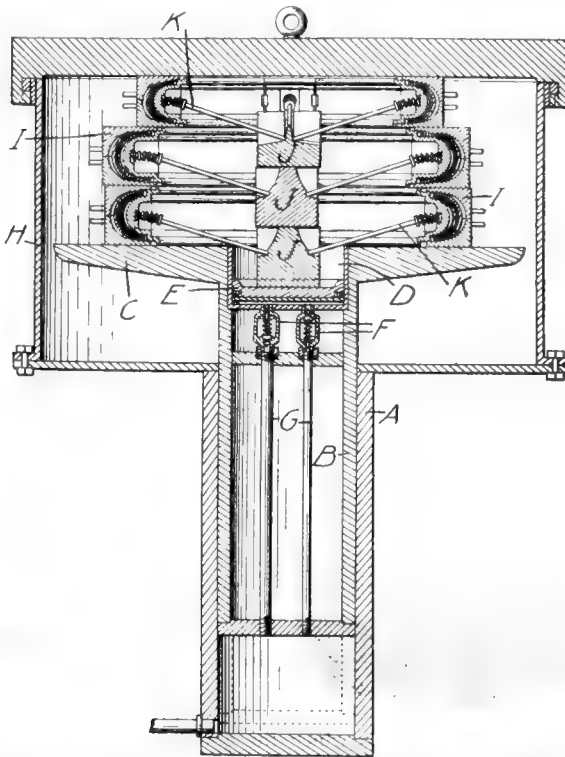


A—Mixer Trough.
B and C—Kneader Rolls.

DEE'S VULCANIZER, MOLD AND EXPANSIBLE CORE.

IN this invention mechanical pressure is applied to the inner tire casing during vulcanization. It is a combination of vulcanizer press, mold and collapsible and expansible core.

The casing is built up on the core and enclosed in the mold, which is then transferred to the vulcanizer press. The center block is located on the auxiliary piston and the four spring arms inserted. A second mold, containing a tire, is then placed on top



A—Cylinder. B—Ram. C—Platen. D—Auxiliary Cylinder. E—Auxiliary Piston. F—Inlet and Outlet Valves. G—Inlet and Outlet Pipes. H—Vulcanizer Shell. I—Two-part Molds. J—Center Blocks. K—Spring Arms.

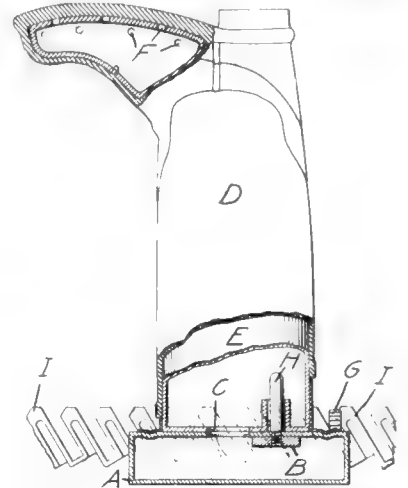
of the first mold and a second block is located on the first and the spring arms inserted. This process is repeated until the heater is full. The head is then locked in place, pressure is applied to the molds by the main ram and live steam is admitted to

the heater. Pressure is then applied to the auxiliary piston which raises the center blocks, spreading the spring arms radially. This expands the core, stretches the fabric and shapes the tire and tread against the inner walls of the mold. [United States patent No. 1,120,453.]

A VACUUM VULCANIZER FOR FOOTWEAR.

CROWLEY'S apparatus for vulcanizing hollow articles subjects the inner and outer surfaces to different gases

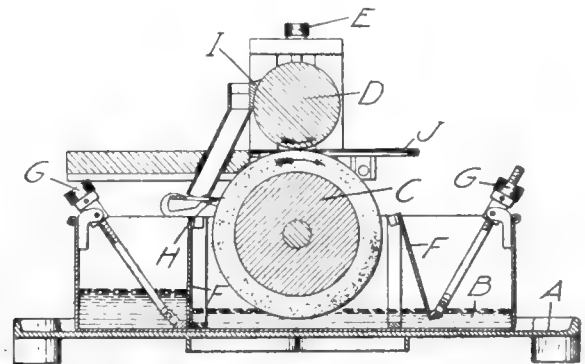
or vulcanizing media, and also to different pressures. The vacuum chamber shown in cross section is made long enough to support several boot trees held in position by pins. A transverse bar with twisted ends fits in the staggered racks and supports the chamber and trees. The boots are built up on the trees and seated in position on the hollow shell in the work room. Then, with others, it is placed in racks secured in an ordinary heater. Air pressure or vacuum is applied to the interior of the perforated tree through the connections and openings provided for that purpose. [United States patent No. 1,122,695.]



D—Vacuum Chamber. B—Transverse Bar. C—Air Opening. D—Boot. E—Boot Tree. F—Tree Perforations. G—Air Connection. H—Supporting Pins. I—Recks.

MACHINE FOR CEMENTING VAMP LININGS.

GILLESPIE'S machine applies rubber cement to leather shoe linings in an even and uniform manner. The base supports a cement tank in which revolves a felt-covered cement-applying roller. The tank is divided by two adjustable partitions which control the amount of cement fed to the applying roller. The surplus is scraped off this roller and flows back into the tank. The brass presser roller is adjustable vertically. This roller also



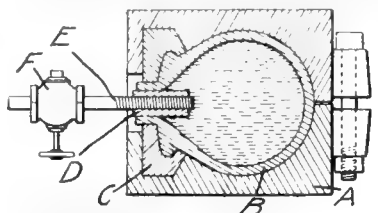
A—Base Plate. B—Cement Tank. C—Applying Roller. D—Brass Presser Roller. E—Roller Adjusting Screws. F—Hinged Partitions. G—Partition Adjusting Screws. H—Lower Scraper. I—Upper Scraper. J—Delivery Table.

has a scraper that removes the surplus, which is caught in a trough and returned to the tank. The shoe lining is fed into the

machine from the left, passes between the rollers and is coated on the lower side. It is prevented from clinging to the applying roller by a wire frame attached to the delivery table. [United States patent No. 1,119,820.]

SWINEHART'S TIRE VULCANIZER AND MOLD.

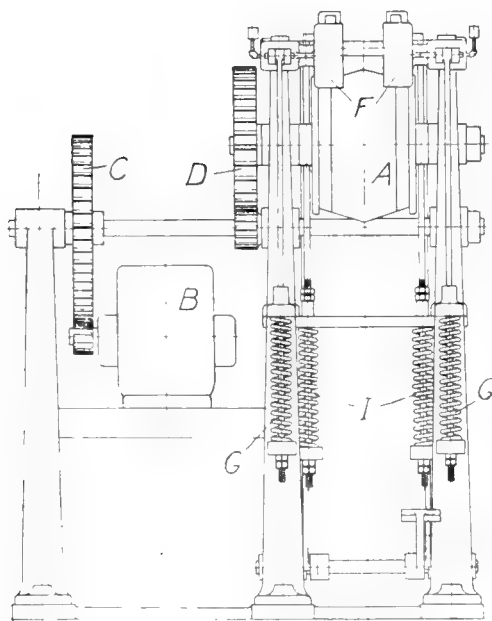
WHEN a tire is being cured by hydraulic pressure applied to the interior, it is sometimes injured by excess pressure. In this device the excess pressure escapes automatically. The tire is placed in the mold and filled with water through the pipe provided for that purpose. The mold is then subjected to pressure in a hydraulic vulcanizer press and live steam admitted. This expands the water in the tire and presses the casing against the inner surface of the mold. In case there is excess pressure within the tire the relief valve opens automatically and allows it to escape. [United States Patent No. 1,122,333.]



A—Two Part Mold. B—Tire. C—Annular Ring. D—Packing Ring. E—Water Pipe. F—Relief Valve.

THE JOHNSTON BEAD TRIMMER.

THE machine shown in the illustration is used in reclaiming scrap tires. It cuts off both beads of quick detachable or clincher tires in one operation. It has a crowned roll A, driven from the motor B by gears C and D. Two pressure feed rolls E, covered by shields F, are held in contact with the roll A by springs G. Back of the feed rolls are circular knives covered by shields H and held down by springs I. The tire is cut and one end fed into the machine under the rolls E and the circular



JOHNSTON BEAD TRIMMER

knives sever the beads from the casing. The cutters are adjusted to cut off beads of all sizes of tires up to 6 inches. With two operators the capacity is 25,000 pounds in ten hours. [The Turner-Vaughn and Taylor Co., Cuyahoga Falls, Ohio.]

OTHER DEVICES.

TORREY'S SHOE BOTTOM FILLER.—This machine keeps the filler material continuously in motion and has a by-pass through which it circulates when the delivery opening is closed. The material is delivered and spread automatically on the shoe bottom. All the operator does is to place the shoes on the jacks and remove them. The machine does the rest. [United States patent No. 1,122,661.]

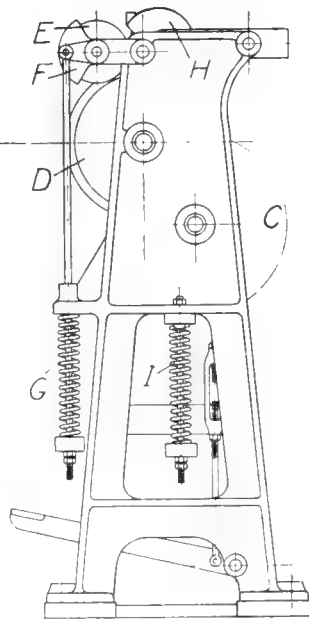
WEITON'S HYDRAULIC VULCANIZER PRESS.—This press has two rams and cylinders which are bolted to opposite sides of a vertical vulcanizer shell. The upper ends of the rams are attached to a ring shaped cross-head, which has two hooks on the underside for engaging and lifting the vulcanizer door. Two rods attached to the cross-head pass through stuffing boxes in the door and support on their lower ends a floating platen within the shell. The outside rams and cross-head hooks engage and raise the cover while the rods raise the platen. The heater is then filled with molds and the door locked. The rams are raised, and the rods and platen pull the molds up against the cover. [United States patent No. 1,121,214.]

STAPLE'S ROPE PACKING MACHINE.—This invention relates to the manufacture of round packing in continuous lengths. Under the frame of the machine are reels holding the strands of material. These are passed through an assembling ring and around a grooved wheel, where they are gathered together. This core is then passed up through the center of a revolving spool table and attached to a grooved wind-up wheel. Mounted on the spool table are a series of spools containing strands of material. The ends are attached to the core and the spool table is revolved, winding the strands around the core as it is drawn through. [United States patent No. 1,122,168.]

TIRE FABRIC STRIP FEEDER.—Brucker's machine feeds strips of frictioned fabric from stock rollers to a power driven tire core. The reel frame is mounted on a shaft journaled in two side frames. It carries four power driven fabric rollers and four friction driven wind-up rollers for the lining. The feed of the frictioned fabric to the core is regulated by a tension weight and the lining is wound up on a separate roller. When one stock roller is emptied another is brought in position by turning the drum. [United States patent No. 1,121,793.]

NALL'S TAKE-OFF REEL.—This machine spools fabric coated with uncured rubber and interposes the lining at the same time. A square reel frame is mounted on a shaft journaled in two side frames. It supports at opposite corners two lining spool shafts driven independently by chain belting from the center shaft. The coated fabric is attached to the empty fabric spool and the lining from the lining spool is wound up with it when the fabric spool is revolved. When the spool is filled the reel frame is reversed by being rotated. This places an empty fabric and a liner spool, previously placed in the frame, in position to be filled with fabric and lining. [United States patent No. 1,120,520.]

DEES' COLLAPSIBLE CORE.—This core is in four sections, joined by wedge keys and has an annular water groove on the periphery. An inlet conveys water under pressure to this groove and the same pipe acts as a drain. The tire is built up on the core and wrapped or placed in a mold. Before or during vulcanizing water is forced between the core and the tire, which stretches the fabric. A small quantity of water produces the desired result. [United States patent No. 1,117,803.]



NEW TRADE PUBLICATIONS.

THE Gutta Percha & Rubber, Limited, of Toronto, Ontario, has just issued a small but handsome gray booklet devoted to its Maltese Cross tire. This company makes pneumatic tires in plain tread and non-skid styles, the latter being of the straight wall type built with a series of wire cables in the bead finish, with a floating flap to protect the inner tube. The booklet contains various tables, illustrations of standard types of rims and a list of the company's branches and service stations from St. Johns, New Brunswick, to Vancouver, British Columbia.

Firestone racing records form the subject of an attractive folder the Firestone Tire & Rubber Co., of Akron, Ohio, are sending to dealers, with a request to hang it in the window. It treats particularly of the road races recently held through the deserts and over the mountains of California. In the Los Angeles-Phoenix event of 671 miles, the El Paso to Phoenix run of 533 miles and the 300 mile no-stop run at Corona, driven by Barney Oldfield at an average speed of 85½ miles an hour, the first machines to finish were equipped with Firestone tires. The company is justly proud of such a galaxy of victories and the folder, with its map and scenes at the races, is to commemorate them.

"A Year with Nassau Tires" is the title of an artistically designed and handsomely printed pamphlet distributed by their makers, the Thermoid Rubber Co., Trenton, New Jersey. It is mainly devoted to the victories won during the year on Nassau tires by such speed kings as De Palma, Burman, Mulford and Rickenbacher and advice to tire users in connection with the merits of the Nassau tire.

"The Sociological Work of the New Jersey Zinc Co." is admirably described in an illustrated pamphlet by Florence Hughes, superintendent of the Palmerton Neighborhood House, Palmerton, Pennsylvania, established by the above-named company as a social center for its employes and their families, whose social welfare, judging from the pamphlet in question, the company most successfully studies to promote.

"The Staggard" for December, published monthly by The Republic Rubber Co., Youngstown, Ohio, is brimful of reasons why automobilists should use the Staggard tire in preference to any other. The publishers have collected practical arguments in their favor from all parts of the world.

"The Goodrich" for December, with its seasonable cover, is full of Goodrich "meat." The illustrations are particularly fine and well printed, and as they constitute a large share of the contents of the number it is fair to call it a good one.

Boonton Bakelite has a reputation for efficiency as an insulation that has won it a place as a substitute for wood, lard rubber, etc., on electrical apparatus. The fact that it comes from the mold finished accurately to size, all ready for use, with metal inserts in place, makes it economical as well as convenient. Under the title "Molded Insulation" the Boonton Rubber Manufacturing Co., Boonton, New Jersey, issues an attractive catalog of the Bakelite goods.

The Kewaunee Manufacturing Co., of Kewaunee, Wisconsin, who, as "laboratory furniture experts," devote special attention to the manufacture of educational and technical laboratory furniture, send us a copy of their catalog, No. 9, of laboratory furniture, which includes everything in this line needed in the equipment of laboratories for industrial wants and commercial establishments. It contains upwards of 260 pages, with numerous effective illustrations representing laboratory furniture of every description. It gives full particulars as to the purpose, dimensions, construction, shipping weight and cost of every article illustrated and includes testimonials from institutions having similar pieces in use.

The appearance, for the eleventh year, of the Christmas number of the "Times of Ceylon" is announced by that publication in a neat little folder, the tinted cover of which is a reproduction of a water-color sketch of a "proa" in full sail for a palm-fringed shore, while the title page shows a "life size" picture of an Indian rupee, the price of the special number. The interior is devoted to a list of its contents, included in which we note photographs of Estate Kanganies.

Special mention should be made of a particularly fine assortment of high grade colored calendars—some of them printed for leading dealers in rubber footwear—received from the American Lithograph Co. of New York, which for many years has had the reputation of printing a greater variety and a greater number of colored calendars than any other lithograph company in the world.

CALENDARS, ETC., FOR 1915.

WE wish to thank our friends in the trade for what is probably the finest collection of calendars, desk pads and other reminders of the commencement of a New Year that has ever been on hand at one time in this office. Space is not available for merited description of these souvenirs, many of which are so pleasing in design and so well executed as to form reminders of their donors long after the latest date they cover. The following is a list of the contributors to this collection:

CALENDARS.

- Adamson Machine Co., The—Machinery—Akron, Ohio.
- Akron Rubber Mold & Machine Co., The—Akron, Ohio.
- Boston Woven Hose & Rubber Co.—Manufacturers of mechanical rubber goods—Boston.
- Brown & Co., W. G.—Dealers in crude and reclaimed rubbers—Cincinnati, Ohio.
- Daggett, Stanley—Manufacturer and importer of colors, chemicals, etc.—New York.
- Davol Rubber Co.—Manufacturers of druggists' sundries and rubber goods for home and hospital—Providence, Rhode Island.
- Essex Rubber Co.—Manufacturers of rubber soles—Trenton, New Jersey.
- Holmes Bros.—Rubber molds and machinery—Chicago.
- Katzenbach & Bullock Co., Inc.—Importers of chemicals and colors—Trenton, New Jersey.
- Kokomo Rubber Co.—Manufacturers of tires and inner tubes—Kokomo, Indiana.
- Lufbery, Jr., Geo. F.—Manufacturer of chemicals—Elizabeth, New Jersey.
- North British Rubber Co., Limited—Manufacturers of all kinds of hard and soft rubber goods—Edinburgh, Scotland.
- Portage Rubber Co., The—Manufacturers of tires—Akron, Ohio.
- Rubber Products Co., The—Manufacturers of mechanical goods, druggists' sundries and fruit jar rings—Barberton, Ohio.
- Rubber Regenerating Co., Limited, The—Reclaimers—Manchester, England.
- Salisbury & Co., W. H.—Dealers in rubber belting, hose, packing, etc.—Chicago.
- Stamford Rubber Supply Co., The—Rubber substitutes—Stamford, Connecticut.
- Stedman Co., The J. H.—Scrap rubber dealers—Boston.
- Taintor Manufacturing Co., The H. F.—Manufacturers of whitening and Paris white—New York.
- Tyson Brothers, Inc.—Manufacturers of rubber substitutes and chemicals—Carteret, New Jersey.
- West India Committee Circular Publishers—London, England.

DESK PADS, DIARIES, ETC.

- Apsley Rubber Co.—Manufacturers of rubber footwear and clothing—Hudson, Massachusetts.
- Coulston & Co., J. W.—Dry paints and colors—New York.
- Federal Rubber Manufacturing Co.—Manufacturers of tires, inner tubes and mechanical rubber goods—Milwaukee, Wisconsin.
- Lowenthal Co., Inc., The—Scrap rubber dealers—New York.
- New Jersey Rubber Co. Reclaimers—Lambertville, New Jersey.
- Royle & Sons, John—Designers and builders of special machinery—Paterson, New Jersey.

ABOUT A FAMOUS MILITARY ORGANIZATION.

FAMOUS among the military organizations of the United States is the Ancient and Honorable Artillery of Boston, of which Captain Francis H. Appleton, of the rubber reclaiming firm of F. H. Appleton & Son, Inc., has recently been commander. It is famous because of its age, being the oldest military organization in the United States; and famous on both sides of the water because of the notable good fellowship of its members and its many social achievements. It was founded in 1638 by a former member of the Honorable Artillery Company of London, and in 1912, by way of celebrating the opening of its 275th year, it accepted an invitation to visit the parent company in London. The 275th annual record of the company has just been published, which is a book of 272 pages, chiefly devoted to an account of that visit—with Captain Appleton in command—beginning with the invitation, the start from Boston, the voyage across, and including the innumerable attentions showered upon the company in London.

What most impresses one in looking over this book is the fact that the commander of this company at this particular time had perforce to be a very ready speaker, for what with banquets, receptions and unveilings, he was always on the firing line of oratory.

This book will prove not only interesting to the 600 and more members of the company, but to all Americans who enjoy international amenities. It is lavishly illustrated. It was compiled by the Paymaster-Sergeant, Arthur T. Lovell, and printed by the Norwood Press, Norwood, Massachusetts.

FOR BETTER RELATIONS WITH OUR SOUTHERN NEIGHBORS.

"The Development of Intellectual and Cultural Relations Between the United States and other republics of America" is the subject of Publication No. 5 of the Division of Inter-course and Education of the Carnegie Endowment for International Peace. After giving particulars as to the preliminary work of the division, it describes the results of a tour made by a party of university men and educators of the capitals and important centers of the South American nations in the interest of better intellectual relations. The publication, which is edited by Harry Erwin Bard, is published in English, Portuguese and Spanish and has an instructive preface by President Nicholas Murray Butler, of Columbia University, New York, who is Acting Director of the Division.

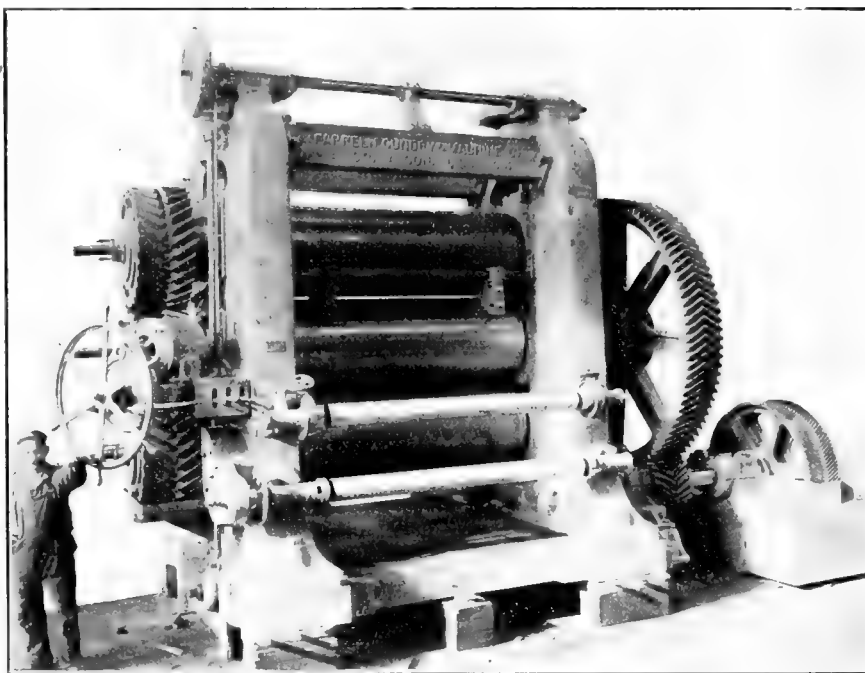
COTTON GROWING IN THE WEST INDIES.

In view of the increasing importance of the cotton growing interest in the islands, the Imperial Department of Agriculture for the West Indies recently published, in the form of

an octavo pamphlet of 120 pages, "Cotton Cultivation in the West Indies." In a preface to the work the Commissioner of Agriculture for the West Indies, Hon. Francis Watts, expresses his appreciation of the manner in which it has been compiled by Mr. W. Nowell, D.I.C., who prepared the chapters on botany and diseases, the chapter on insect pests being by Mr. H. A. Ballou, M.Sc. The information presented has been brought up to date and numerous photogravure illustrations are included.

THE LARGEST THREE ROLL CALENDER.

BIG machines are an adjunct of big business. That being so the huge calender shown in the accompanying illustration—the largest yet produced—may be taken as an index of the growth of rubber manufacture. This is not for use in home manufactures but is already on its way to England. Speaking first of its dimensions, it is a 28 x 78 three-roll machine, is a trifle over 12 feet high, and occupies on the floor a space 16 x 6 x 9 feet. It is driven by motor and requires from 100 to 200 horsepower, depending on the stock to be calendered. The rolls are chilled, accurately ground, polished and chamber bored. Stuffing boxes are provided for heating or cooling, and the bearings are brass lined, lubricated by sight feed oil cups. The rolls are geared for friction 2 to 3 or even motion, the change being made by keys. All gears are cut double heli-



THE LARGEST THREE ROLL CALENDER.

cal, are encased and run in suitable lubricant.

A motor and controller mounted on one of the side frames drive the vertical adjustment mechanism of the rolls. The power clutch can be disengaged and a hand wheel used for fine adjustment. There are four control levers within easy reach. The first controls the motor or hand wheel drive, the second connects the top and bottom rolls with the motor drive or handwheel, the third and fourth control the worm clutches for the vertical adjustment of the roll necks, independently of each other.

There are also two dial gages attached to the side frames at the front and back for registering the vertical roll adjustment to a one-thousandth part of an inch. These enable the operator to see at a glance the exact thickness of the calendered sheet.

The thrust of the worm shafts is taken up by ball bearings. When adjusting the top roll vertically, ball bearing collars remove the friction of the roll from the vertical screws so that they can be easily turned. The calender sheets from 15 to 45 yards a minute and frictions two-thirds that amount. The take-up and brake can be run either way so that the fabric can be fed in at either side. [The Farrel Foundry & Machine Co., of Ansonia, Connecticut.]

The Obituary Record.

JAMES CLAY HARVEY

DELAYED by the unsettled state of the country, word has but just reached us of the death, in Orizaba, Mexico, on December 11, of James C. Harvey, at the age of 64. This, far too soon, terminates the career of one of the most remarkable men that Central America has known. His life was full of change and romantic effort. He was born at Hamilton, Ontario, of Scotch and English parents, and educated in the schools of the Dominion.

He early evinced a desire to see tropical countries and secured a position as purser's clerk in a steamship line trading between New York and West Indian and Central American ports. Soon afterward he became an articled apprentice in the Castle line of Liverpool. This service extended over a period of six years, during which he visited South Africa, India, Ceylon and Australia, making also several sojournings of some length in planting districts in the Indies.

He took advantage of the opportunities thus afforded to study tropical agriculture under many varying conditions and to advance a deep inborn taste for botanical and horticultural pursuits. He subsequently voyaged to the east and west coasts of South America, finally arriving in California, where he settled, married, and became an American citizen. There he engaged in manufacturing, commercial and horticultural work. But the ruling passion of his life was not to be quenched, and in 1899 he went to Mexico, and spent the greater part of a year in examining the planting regions in the states of Veracruz and Oaxaca. The result was that, in company with a few associates, he acquired land situated in the Trinidad valley district in Veracruz, to which he gave the name of "La Buena Ventura," and about one-half of which he developed and devoted principally to the cultivation of rubber and cacao.

A man of thought and of action, with a keen sense of humor, an enthusiastic botanist, a cosmopolitan of the broadest sympathies and interests, and a raconteur of no mean ability, Mr. Harvey combined all the qualities that go to the making of a delightful companion and staunch friend.

To Mr. Harvey belonged the credit of introducing many useful plants hitherto unknown to Mexico, such as the East Indian jack fruit, cinnamon, African akee fruit, Surinam cherries, grafted Indian mangos, cardamoms, economic bamboos; Indian, Malayan and South American palms; fiber producing plants, such as *Sansiviera Zeylanica*, *S. Guineensis*, and the famous Manila hemp plant (*Musa textilis*); also many newer varieties of pineapples, bananas, oranges, etc., besides an infinity of flowering trees, shrubs and creepers, the cultivation of all of which, with very few exceptions, has proved entirely successful.

Mr. Harvey was a correspondent of the principal botanical stations in the tropics, including the royal botanic gardens at Calcutta, Peradeniya, Singapore, Natal, Mauritius, Seychelles and the Gold Coast, as well as the famous institution at Kew, London, this correspondence relating to the results of experience and new ideas in planting methods, and the interchange of seeds and plants adapted to the respective climatic conditions.

For years Mr. Harvey was the friend and helper of the hundreds of Americans who haunted the Tierra Caliente. His home at La Buena Ventura was the stopping place for botanist, tourist, promoter. He welcomed every white man, helped him in his way, and often went along with him. In the days of the Casteleja craze, he, who was a true believer in that tree, was friend, counsellor, elder brother to the planters.

Never over strong, he taxed his strength for others day in and day out. His particular joy was orchid hunting, and his collection was a large one. He also accumulated by exploration and by exchange the finest collection of palms in Central America.

The last few years of his life were spent in trying to grow *Hevea* rubber on the *Castilloa* plantation already installed. In this he was beginning to have decided success when the civil war in Mexico broke out. Mr. Harvey stayed by the properties under his charge and protected them—sometimes by fighting, at others by persuasion.

H. N. FENNER.

Herbert Nicholas Fenner, president of the New England Butt Co., of Providence, Rhode Island, died of pneumonia on January 5 at his home in that city, after a brief illness.

He was born in Providence, March 13, 1843, the son of Nicholas Arnold and Deborah (Brown) Fenner, and obtained his education in the schools of that city, after which he became associated with the New England Butt Co., succeeding his father. He was for many years treasurer of the company, later becoming its president. He was much interested in public affairs and was also prominent in club life, being a member of many of the important societies and clubs of the State. He is survived by his wife and by one son, Herbert L. Fenner.



JAMES CLAY HARVEY.

THOMAS MORGAN TURNER.

Thomas Morgan Turner, president of the J. Spencer Turner Co., died suddenly on January 10 at his home, 5 West Ninth street, New York. Mr. Turner was born in 1857. After completing his education at the Polytechnic Institute, Brooklyn, in 1876, he entered the firm of which his father, J. Spencer Turner, was one of the founders. In 1905 he became president of this concern, which deals in cotton ducks and fabrics of all descriptions for the rubber trade. He was president of the Consolidated Cotton Duck Co. and an officer in several other important fabric concerns, and a member of the Union League, New York Yacht, Riverside Yacht, Lambs and Republican Clubs.

PROF. F. W. HINRICHSSEN.

Prof. F. W. Hinrichsen, who in spite of his comparative youth had accomplished so much toward solving the chemical problems in the treatment of caoutchouc, and had won an international reputation, fell on the battlefield before Lodz on December 2. His early death, at 38, robs the chemical world of a worker whose achievements would probably have been considerable. He was

born in Berlin in 1877, studied at Berlin University and at Heidelberg, and later was associated with some of the most famous German chemists. He was also the author of several notable books, particularly "Caoutchouc and Its Test," published in 1910.

A. W. BRUNN.

A. W. Brunn, who for a number of years had been identified with the rubber trade of New York, as a crude rubber merchant, died January 23 at his home in Hackensack, New Jersey.

COLONEL R. K. BIRLEY.

By Our English Correspondent.

Colonel R. K. Birley, C. B., V. D., D. L., of the firm of Charles Macintosh & Co., Limited, Manchester, England, died of apoplexy on December 10 at his residence in that city, at the age of 69 years.

He was a son of the late Richard Birley, J. P., D. L., of Manchester, and after leaving Winchester College he studied engineering preparatory to entering the family business of Chas. Macintosh & Co., of which his father was a member. It is understood that the late Col. Birley's wish was to enter the Royal Artillery rather than to become a business man. This desire descended to a later generation, and his son, Major R. A. Birley, wounded and a prisoner in Germany, is a member of this military body.

Unlike most obituary notices dealing with prominent rubber manufacturers, it is not possible in the present case to point to important developments or achievements in the domain of science or technology. The lengthy obituary notices which appeared in the press of his native city dealt more or less ex-

years engineer at the Cambridge street works. In the course of this visit he gained an insight into American procedure, visiting several of the rubber works. Other journeys abroad of a business nature were to Brazil, and to Barcelona, where his firm had a branch establishment for making up proofed cloth. He had for many years been a member of the Society of Chemical Industry. He was a regular reader of THE INDIA RUBBER WORLD, of which he always spoke highly as a technical publication. On the formation of the India Rubber Manufacturers' Association in 1899 he was elected the first chairman.

Col. Birley took a lively interest in the rubber plantation movement and was chairman of the Beaufort Borneo Rubber Co., as well as director of Sablas-North Borneo Rubber Co., the former having been largely subscribed in the Manchester district.

A man of commanding appearance, those privileged to enjoy a close acquaintance found him possessed of a genial nature and a kindly disposition.

The funeral was a military one, the interment being in the family vault at Worsley Church, near Manchester. The firm was represented by Sir Frederick Smith, Bart. (chairman of directors), Colonel Hugh A. Birley, Philip A. Birley and J. Harold Birley, directors, and L. Clay, secretary. James Tints (Irwell Rubber Co.) and William J. Henderson (Ancoats Vale Rubber Co.) represented the India Rubber Manufacturers' Association. There were also present deputations from various military organizations and hospitals in addition to relatives and friends.

ARCHIBALD COLQUHOUN.

The recent decease of Archibald Colquhoun, editor of "United Empire," is a source of sincere regret to those interested in his able work for that publication and to his colleagues in the Colonial Institute. Deceased, who was an earnest and logical advocate of imperial unity and possessed a wide knowledge of the world and its peoples, although so vigorous in his mentality and decided in his opinions, was so kindly and considerate in their expression as to gain friends on every hand. "United Empire" personified his sincerity and intellectuality.

Jacob Cordier, for over fifty years connected with the American Hard Rubber Works at College Point, New York, died December 30 at the Flushing Hospital. He was born in France in 1839.

Samuel C. Kale, for the past 14 years in the employ of the Faultless Rubber Co., of Ashland, Ohio, died in that city on December 15, of heart failure. He was 53 years of age and is survived by his wife, a daughter and two sons.

H. C. Bissell, for more than 20 years with the Habirshaw Wire Co., of Yonkers, New York, died January 21 at his home in that city, of pneumonia.

RUBBER IN INDO-CHINA.

According to the official statistics in the "Bulletin Economique" of Indo-China, the exports of crude rubber in 1912 represented \$203,008, and in 1913 \$151,809. The falling off was caused by the decline of the article in value.

Experiments with *Hevea Brasiliensis* reported from Cochin China, show a distinct connection between the weights of the seeds planted and the height of the stems after twenty weeks' growth. In four groups of seeds the results show average weights of one-tenth, one-eighth, one-sixth and one-fifth of an ounce; the average height attained within the period stated being 10, 17, 22 and 26 inches. One-seventh of an ounce was considered the minimum weight for insuring good results.



From the India Rubber Journal

COL. R. K. BIRLEY.

haustively with the deceased's long connection with the volunteer artillery, dismissing his business connection in a single line. These military activities engrossed his attention for nearly half a century and obtained for him the Volunteer Decoration, the Deputy Lieutenantship of the County of Lancaster and, last but not least, the Companionship of the Most Honorable Order of the Bath.

To a greater extent than any of his partners of thirty years ago Colonel Birley took an interest in science and it was on his initiative that the works' laboratory was founded on a modest scale in 1884. In the late 70's he paid a visit to the United States, in company with Thomas Williams, who was for many

News of the American Rubber Trade.

WALPOLE SALE AND DIVIDEND.

A SALE will be held at Walpole, Massachusetts, at 11:30 a. m. on Wednesday, March 10, to dispose of the business of the Walpole Tire & Rubber Co. This business will be sold as a whole and as a going concern, and bids may be submitted without other restriction than that each be accompanied by a certified check for \$50,000.

An appropriation of \$37,500 has also been made from the funds in the hands of receivers for the payment of a 3 per cent. dividend to creditors, on claims allowed up to January 4. There have been three previous dividends of 4 per cent. and one of 10 per cent., making in all 25 per cent.

UNITED STATES RUBBER CO. MEETING.

After the meeting of the Board of Directors of the United States Rubber Co. held January 7, the president, Samuel P. Colt, gave out the following statement:

"The Board of Directors of the United States Rubber Co. at their meeting held this day declared the regular quarterly dividends upon the preferred and common stocks of the company, namely, 2 per cent. upon the first preferred, 1½ per cent. upon the second preferred and 1½ per cent. upon the common.

"The treasurer's statement as submitted to the meeting showed the net earnings of the company for eleven months, from January 1 to November 30, 1914, sufficient to cover the dividends declared for the year 1914, including those declared today. There was no estimate of the December earnings submitted, but whatever they may be will be additional to the dividend requirements.

"While there has been some improvement in the business for December, which is continuing into January, the existing war introduces an unprecedented uncertainty into the situation.

"There is every reason to believe that the embargo placed by Great Britain upon the importation of crude rubber will be so modified as not to embarrass the company in obtaining its requirements of the crude material."

RUBBER COMPANY DIVIDENDS.

The United States Rubber Co. has declared a quarterly dividend of 2 per cent. on its first preferred stock, a quarterly dividend of 1½ per cent. on second preferred stock and a quarterly dividend of 1½ per cent. on its common stock, payable January 30 to stockholders of record on January 15.

The Canadian Consolidated Rubber Co., of Montreal, Quebec, declared a regular quarterly dividend of 1¾ per cent. on the preferred stock of the company, payable December 31 to stockholders of record on December 19, but has passed the dividend on its common stock.

The American Chicle Co. has declared a monthly dividend of 1 per cent. on its common stock, payable February 20 to stockholders of record on February 15.

The Racine Rubber Co., of Racine, Wisconsin, paid on January 2 its 11th regular quarterly dividend of 1¾ per cent. on the preferred stock of the company, which is 7 per cent. cumulative.

The Hood Rubber Co., of Watertown, Massachusetts, has declared its 28th consecutive quarterly dividend of 1¾ per cent. on the preferred stock of the company, payable February 15 to stockholders of record on January 28.

The Fisk Rubber Co., of Chicopee Falls, Massachusetts, has declared a regular quarterly dividend of 1¾ per cent. on its preferred stock, payable February 1 to stockholders of record on January 21.

THE FEDERAL RUBBER MANUFACTURING CO.

The Federal Rubber Manufacturing Co., of Milwaukee, Wisconsin, is again adding to its plant, having completed plans for a three-story addition 124 x 44 feet, of brick and mill construction.

This company is manufacturing a special "Redskin" inner tube, the distinguishing feature of which is a valve base reinforced by extra thickness of rubber, vulcanized integrally with the tube and therefore a part of it. This reinforcement, which cannot break or work loose, is claimed to add materially to the strength of the tube. To protect the tube from injury in transit, it is enclosed in a red cloth bag before being packed in its carton.

TRADE OPPORTUNITIES FROM CONSULAR REPORTS.

A Portuguese importing firm is in the market for automobile tires which are stated to be for its branch house in South America. Prices f. o. b. New York or c. i. f. South American port are desired. Report No. 15,007.

A manufacturer in Europe wishes to communicate with manufacturers of vulcanite tubes for fountain pens. Report No. 15,096.

A dealer in France would like offers on dental supplies of all kinds. Report No. 15,104.

A dealer in the Far East desires names and addresses of manufacturers of sporting goods, bicycle tires, etc. Report No. 15,167.

An electrical engineer in a leading South American city asks for catalogs and prices on electrical supplies, wire, cable, etc. Report No. 15,184.

A foreign import and export agent desires to be put in correspondence with exporters of unvulcanized rubber rings for preserve jars. Report No. 15,210.

A business man in Russia wishes to get in touch with American manufacturers of rubber ribbons similar to samples which may be examined at the Bureau of Foreign and Domestic Commerce and its branch offices. Large quantities of this material are imported into Russia. Report No. 15,250.

A dealer in Great Britain wants to secure agencies for rubber goods, such as surgical articles. Report No. 15,317.

A firm in the United Kingdom which manufactures surgical trusses wishes to form commercial relations with manufacturers of imitation rubber pads. Report No. 15,351.

A European business man desires to act as representative for American manufacturers of balata and other belting. Report No. 15,357.

A general import agent in Norway desires to represent, on a commission basis, American exporters of rubber goods. Report No. 15,378.

A recent decision of the Board of United States General Appraisers sustained the protest of The B. F. Goodrich Co., of Akron, against assessment at 15 per cent. on wire staples used in anchoring cords while they are being knitted into form for use in making automobile tires. This article properly comes under paragraph 554 of the 1913 tariff, entitling it to free entry.

Imports of new scrap rubber are entitled to free entry, according to a decision handed down on January 19 by the Board of United States General Appraisers, protest having been entered by N. E. Berzen against the assessment at 10 per cent.

SOME RECENT CUSTOMS RULINGS.

Replete with information for rubber manufacturers.—Mr. Pearson's "Crude Rubber and Compounding Ingredients."

WILLIAM T. COLE.

MR. W. T. COLE, president of the Mechanical Rubber Goods Association from 1908 until December 10 last, and now chairman of the "Mechanical Group" of the Rubber Club, is very much a "live wire." The brief of his business career, sketched by himself, is so well done that we quote:

"My life is an open book, or rather ledger, and I will tell you the little story in the first person, leaving it to your ac-



WILLIAM T. COLE.

knowledge editorial skill to make it readable. Do not accuse me of trespassing, as you took down the bars and invited me in.

"I was born in Paterson, New Jersey (1863), where my father was engaged in building locomotive frames for the Cooke, Rogers & Grant Locomotive Works, located in that city. (I chuckle to recall that Colonel Colt also admits being born in Paterson.)

"I enjoyed an academic education supplemented by a business course and technical training; all of which more or less qualified me to enter (as an employee) the First National Bank of Paterson immediately after my graduation. I remained with the bank for several years, and the recollection of that association is the grandest of my business life, on account of the magnanimity of the broad-minded man composing the Board of Directors and constituting the official staff, in permitting me to engage in outside business to occupy the time before 9:00 A. M. and after 3:30 P. M., and thus keep in check the youthful energy with which I was imbued. I accordingly, in conjunction with two of my closest friends, organized a stock company, of which I was treasurer, for the purpose of manufacturing silk ribbons and brook silk. After two years the business was so well established that I resigned from the bank and merged myself into the firm of Cole & Kuett, with manufacturing plants at Paterson and Sterling, New Jersey.

"The emancipation of women began in 1893, with the advent of tailor made suits, and the silk business was consequently demoralized to an alarming extent, so I said farewell to the fickle *Queen de Soie* and swore allegiance to King Cotton (with a rubber lining) and established myself in the domain of the Fabric Fire Hose Co. I am now, and have been for several years, president and general manager of the Fabric Fire Hose Co."

Mr. Cole is very much of a stickler for the rights of the individual manufacturer. He therefore led in the fight that the Mechanical Rubber Goods Manufacturers' Association made

against the demands of the Insurance Laboratories as to fire hose. In this work he showed himself not only a clear and logical reasoner, but possessed of a trenchant wit and a happy faculty for stating facts that is as pleasant as it is rare. Some of his essays on the rubber manufacturers' position in not being willing to turn over their factories to outsiders and pay them for the privilege, are classics.

PERSONAL MENTION.

Following the resignation on January 23 of C. I. Wilson, purchasing agent of the Boston Woven Hose & Rubber Co., of Boston, J. B. McMahon, who has held the position of assistant purchasing agent, was promoted to the vacancy, M. G. Hopkins becoming assistant.

H. Esmond Bailey, son of C. J. Bailey, 22 Boylston street, Boston, is now associated with his father in promoting the sales of the Bailey "Won't Slip" heel.

G. H. Elliman, chemist for the King Rubber Co., of Clarendon Hills, Massachusetts, has developed a special compound for use in rubberset brushes. Mr. Elliman was previously employed as chemist by the Boston Woven Hose & Rubber Co., the B. & R. Rubber Manufacturing Co., and the Davidson Rubber Co. Mr. Elliman recently joined the King organization.

E. L. Hill, formerly superintendent of the insulated wire and power cable plant of the American Steel & Wire Co., at Worcester, Massachusetts, is now consulting engineer of the Hazard Manufacturing Co. at Wilkes-Barre, Pennsylvania.

Edward C. Southwick, who for the past three years has been traffic manager of the Revere Rubber Co. at Providence, Rhode Island, was elected January 1 to a similar office with the Providence Chamber of Commerce.

John V. Mowe, for a long time identified with the sales forces of the Firestone Tire & Rubber Co. and the Goodyear Tire & Rubber Co., of Akron, has been appointed assistant sales manager of the Kelly-Springfield Tire Co. branch at Detroit, Michigan.

D. C. Hathaway has also associated himself with the Kelly-Springfield company, at Cleveland, Ohio. He is well known to the trade of that section, where for a number of years past he has represented the Firestone Tire & Rubber Co.

The Republic Rubber Co., of Youngstown, Ohio, is about to open a branch in London, of which Frank V. Springer, who has been head of the eastern sales department, with offices in New York, will be manager. Mr. Springer will be succeeded in New York by Herbert W. Bixler, formerly assistant general sales manager of the company at Youngstown.

Walter W. Macdonald informs us that he has severed his connection with the Patterson Rubber Co., Lowell, Massachusetts, to accept the position of superintendent of the Century Rubber Co., Plainfield, New Jersey.

A. O. Holroyd, who will be recalled as the pioneer in the introduction of the Dunlop tire in the United States, is now a resident of Daytona, Florida. He is one of the owners of the Prince George Hotel.

Frederic H. Sanford, formerly of Manaos, Brazil, where he was manager of the Adelbert H. Alden Co., Limited, is at Miami, Florida. Mr. Sanford, wife and son had settled in Switzerland, but came to the United States at the outbreak of the war.

C. Gehring, manager of the Paris branch of The Philadelphia Rubber Works Co., manufacturers of reclaimed rubber, of Akron, Ohio, is now in this country, where he expects to remain until the close of the war and resumption of business on a large scale in France.

J. S. McChirg, formerly of Akron, has with others reorganized The S. & M. Rubber Co., of Coshocton, under the name of The McChirg Rubber Co.; authorized capital stock, \$250,000.

L. A. SUBERS AND HIS FABRICS.

THE fabrics are descriptively known as "laminated, cohesive, interwound" and are the results of many years of work on the part of the inventor. First perhaps a word as to this same inventor. He is L. A. Subers, of Cleveland, Ohio, where he was born in 1865. Educated in public and private schools, he studied mechanical engineering under his father, who was



L. A. SUBERS.

an architect and builder and identified with the manufacture of machinery. He became interested at an early age in the development of new inventions, taking out his first patent in 1886.

He also studied corporation and patent law for the purpose of fully familiarizing himself with the establishment of industrial corporations, and also for the purpose of protecting his inventions.

Then, after having been identified with various corporations, he seriously took up the development of his new fabrics for the manufacture of a certain line of rubber products. For seven years he experimented and patented. Some 30 patents are soon to appear here and abroad covering this particular series of fabrics, machinery, processes and devices, in the most important countries of the world.

Mr. Subers has been so long in the atmosphere of the great American patent that he unwittingly talks its language. For example, in describing his fabrics he says

"The primary principle upon which my fabric is built is based upon a laminated, cohesive, interwound principle which naturally is of a tubular form, consisting of yarn elements in numerals.

"That is to say, ordinarily I may use 23-1 cotton from 12 to 18 ends up, 16 of these spools constituting the principle of lamination. In other words, take 23-1-14 ends up as an example; sixteen spools, 14 ends on a spool, would be 224 yarns, making a band of tubular form collapsed, thereby having selvage edges, said yarn elements being laid at a predetermined angle to the axis of the mandrel, usually being $2\frac{1}{2}$ inches or more. The angle at which these yarns are laid or incorporated determines to a great extent the extensibility of the finished tubular, collapsed band.

"Some of the fabric is made from 37-1-25 ends up, thereby having a total of 400 yarns in the finished band, the band averaging from $\frac{1}{2}$ inch to $\frac{3}{4}$ inch in width, and of a thickness averaging $\frac{3}{64}$ inch and up. In the construction of this band I

utilize rubber compound or cement, or any other suitable adhesive, depending on the purpose for which the same is intended, and at the same time I incorporate among said yarn elements ribbon bands of rubber, so that when the entire product, consisting of rubber in the form designated and the yarn elements, is finished, the band of the character described is the result.

"In building tire fabrics and hose of various diameters I am able by the angle at which these yarn elements are laid in the band, and also by the predetermined amount of stretch that is taken out of the band itself before being incorporated into a fabric, to control under pressure to a minimum the elongation, contraction, expansion, twisting and writhing conditions which now exist under the old method of constructing like articles of manufacture.

"That is to say, I can control my fabric to a minimum by the use of the same cotton and the same rubber as is now in vogue by the old method of loom weave, braiding, etc. By my process of distributing the rubber through a large number of yarns, I obtain results heretofore unknown in the art of manufacture of rubber goods of a specific character.

"As an example, the railroad officials have a machine that is called a pounding machine to test air brake hose. Under my principle of constructing air brake hose, the difference in results is as follows: Most any make of air brake hose on the market today, under this severe test, will pound through the rubber and fabric at from five to fifteen blows. In the same thickness of hose, and primarily the same composition of rubber and cotton, my hose will stand not less than fifty blows.

"In all my hose tests I obtained practically one-third more bursting pressure than any hose tested, in comparison with what I have been able to find."

THE INDIA RUBBER WORLD has been in touch with the Subers laboratories for a number of years and has seen some wonderful strength tests in hose and other fabrics. At the present time the Goodyear Tire & Rubber Co., of Akron, has been licensed to use the Subers machines on lease. If we understand Mr. Subers' late communications aright, other companies will be granted licenses, the machines being built and owned by the patentees, The Subers Fabric & Rubber Co.

TRADE NEWS NOTES.

The Marathon Tire & Rubber Co., of Cuyahoga Falls, Ohio, has under way a new addition to its tire manufacturing plant.

The new list of the Fisk Rubber Co., which went into effect January 1, quotes reduced prices on white non-skid casings and gray tubes, and announces the addition to the line of the Fisk non-skid "Red Top" tire and red tubes, an attractive new proposition at approximately the old prices.

The McGraw Tire & Rubber Co., of East Palestine, Ohio, has opened a branch at 667-9 Boylston street, Boston, in the building formerly occupied by the Diamond Rubber Co. Wallace G. Page, for several years general manager of the tire department of the Hood Rubber Co., is manager of this new branch.

The John H. Parker Co., of Malden, Massachusetts, is calling the special attention of the drug store trade to his bathing shoe proposition. The chief line of this company, which started in 1865, is rubber boots with leather soles, but it has specialized for many years in bathing shoes and is now producing an extensive and attractive line.

United States imports of chicle amounted in November last to 435,000 pounds, almost double those of the previous November, which totaled 223,000 pounds.

"Rubber and Its Manufacture" was the subject of an address by Frank H. Van Derbeck, of the Hewitt Rubber Co., of Buffalo, New York, at the meeting of the Society of Chemical Industry on December 14 at Cleveland, Ohio.

NEW COMPANY TO HANDLE SALES OF DODGE MANUFACTURING CO.

The Dodge Sales & Engineering Co. has just been organized and incorporated to distribute in the United States and abroad the products of the Dodge Manufacturing Co., manufacturers of power transmission machinery. The new company takes over the sales and engineering departments of the Dodge Manufacturing Co., warehouses and branch sales and engineering stations in the principal cities of the United States, except Seattle (Washington) and Portland (Oregon). In these two cities the Link Belt & Dodge Products Co., incorporated in October, 1914, under the laws of the State of Washington, will handle all sales and engineering.

Duncan J. Campbell, for many years general sales manager of the old company, goes to the new corporation as vice-president and general manager, taking with him the sales department. The general offices will remain at Mishawaka, which has been the home of the Dodge Manufacturing Co. for 31 years. C. R. Trowbridge, of that city, continues in charge of the department of sales promotion.

NEW INCORPORATIONS.

Bay Ridge Rubber Corporation, January 20, 1915; under the laws of New York; authorized capital, \$6,000. Incorporators: M. Seltzer, 213 First avenue, New York; M. DeWalthorff, 451 Forty-seventh street, and F. Wimpie, 5612 Sixth avenue—both in Brooklyn, New York. To manufacture inner tires, tubes, etc.

Chicle-Mint Corporation, November 30, 1914; under the laws of New York; authorized capital, \$20,000. Incorporators: W. O'D. Laugley, and A. G. Laugley—both of 97 Seventy-second street—and A. B. Roth, 1308 Avenue R—all in Brooklyn, New York. To deal in chewing gum.

Goodspeed-Holder Co., January 11, 1915; under the laws of New York; authorized capital, \$5,000. Incorporators: T. H. Goodspeed and J. W. Goodspeed—both of 122 Monroe avenue, Grand Rapids, Michigan—and G. E. Reed, 306 West One Hundred and Fourth street, New York. To deal in rubber, etc.

Heina Tire Co., Inc., The, January 15, 1915; under the laws of New York; authorized capital, \$15,000. Incorporators: William H. Heina, 506 West One Hundred and Thirty-fourth street; E. V. Derks, 810 East One Hundred and Seventy-ninth street—both in New York—and Edward A. Kammler, 618 Newark avenue, Jersey City, New Jersey. To manufacture tires, etc.

Heliclox Tire Co., Inc., The, January 7, 1915; under the laws of New York; authorized capital, \$100,000. Incorporators: T. H. Soule, Hotel St. Andrew; I. E. Maginn, 434 West Twenty-third street—both in New York—and S. W. Rogers, 156 Highland avenue, Jersey City, New Jersey. To manufacture puncture-proof armor for automobile tires, etc.

International Wire Tire Co., The, November 28, 1914; under the laws of Delaware; authorized capital, \$1,000,000. Incorporators: J. S. Lyons, 412 North Maine street; G. T. Brown, 40 North Main street—both in Wilkes-Barre—and T. A. Zukoski, Plymouth—all in Pennsylvania. To manufacture automobile tires, rims and accessories and to sell automobiles.

Mecca Rubber Co., Inc., January 5, 1915; under the laws of New York; authorized capital, \$1,000. Incorporators: E. J. Kern, 36 Morningside East; K. W. Tompkins, 222 West One Hundred and Forty-first street—both in New York—and G. B. Marshall, 928 Lafayette avenue, Brooklyn, New York. To manufacture automobile tires and rubber goods.

Chester Rubber Tire and Tube Co., January 2, 1915; under the laws of West Virginia, authorized capital, \$2,000,000. Incorporators: P. Freshwater, J. C. Freshwater, E. Freshwater, A. L. Skinner and G. A. Hasson—all of Chester, West Virginia. To manufacture automobile tires and other rubber goods.

Merrill, Inc., Edwin W., January 15, 1915; under the laws of

New York; authorized capital, \$15,000. Incorporators: Grace P. Merrill, E. P. Merrill—both of Lestershire—and F. E. Spaulding, Binghamton—all in New York. To deal in shoes and rubbers at retail.

Monarch Rubber Co., The, December 28, 1914; under the laws of Ohio; authorized capital, \$1,000,000. Incorporators: E. L. Henderson, J. B. Feidler, R. E. Henderson, F. W. McCoy and H. R. Kemerer. Location, Carrollton, Ohio. To manufacture roller and rubber goods, automobile tires, etc.

Monarch Stitched Tire Co., The, December 23, 1914; under the laws of Maine; authorized capital, \$500,000. Incorporators: H. Mitchell (president), H. A. Paul (treasurer), M. G. Mitchell and H. Mitchell—all of Kittery, Maine. To manufacture automobile tires and inner tubes, etc., and to establish selling agencies on a wholesale and retail basis.

National Tireseal Co., Inc., January 15, 1915; under the laws of New York; authorized capital, \$100,000. Incorporators: D. Bloch, 157 West Fifty-fourth street; G. W. Lebolt, Twenty-third street and Fifth avenue, and S. Stern, 158 East Seventy-second street—all in New York. To manufacture a secret compound for sealing tires, etc.

New Castle Rubber Co., The, January 13, 1915; under the laws of Pennsylvania; authorized capital, \$500,000. Incorporators: J. S. Wilson, E. N. Ohl, J. D. Rhodes, C. H. Bolton and W. H. Schoen—all of Pittsburgh—and A. C. Hoyt, New Castle—both in Pennsylvania. To manufacture tires and inner tubes from rubber and other material, automobile accessories and all other articles of commerce from rubber or from rubber and other material.

Peerless Waterproofing & Products Co., Inc., December 26, 1914; under the laws of New York; authorized capital, \$5,000. Incorporators: A. Garfein, 867 Hunts Point avenue; G. Goldman, 1043 Teller avenue, and G. S. Powers, 540 West One Hundred and Fifty-eighth street, New York. To manufacture waterproofing, dust and damp proofing compounds and chemical compositions.

Physicians & Dentists Products Co., Inc., January 15, 1915; under the laws of New York; authorized capital, \$250,000. Incorporators: A. J. Cooke, S. J. Metro and Chas. F. Blair—all of Buffalo, New York. To manufacture plasters, surgical supplies, elastic bandages, etc.

Pure Gum Co., Inc., The, November 21, 1914; under the laws of New York; authorized capital, \$300,000. Incorporators: F. Baumer, 40 West Thirteenth street; H. S. DeCamp, 317 Riverside Drive, and M. Mulet, 45 Broadway—all in New York. Chewing gum business.

Rubber Research Corporation, December 17, 1914; under the laws of Massachusetts; authorized capital, \$15,000. Incorporators: R. C. Harlow, Plymouth; J. H. Stedman and A. N. Hunt, Braintree, and D. A. Cutler, Fairhaven—all in Massachusetts. To manufacture and deal in rubber, rubber compositions, rubber goods, rubber scrap, etc.

Rubber Tire Co., The, December 11, 1914; under the laws of Ohio; authorized capital, \$10,000. Incorporators: O. J. Schwab, J. F. Davey, N. M. Greenberger, F. Falch and H. A. Sullivan. Principal place of business, Akron, Ohio. To manufacture rubber products.

Schoonmaker Co., Inc., E., January 5, 1915; under the laws of New York; authorized capital, \$25,000. Incorporators: E. Schoonmaker, L. N. Mansuy—both of 835 Seventh avenue, New York—and H. I. Huber, 215 Montague street, Brooklyn, New York. General tire manufacturing business.

Wisconsin Tire Co., December 28, 1914; under the laws of Wisconsin; authorized capital, \$40,000. Incorporators: C. A. Bading (president), 294 Farwell avenue, and L. M. Koticki (secretary), 617 Fourth avenue—both of Milwaukee, Wisconsin.

TRADE NEWS NOTES.

The Atlantic Rubber Co. has recently moved from Hyde Park to its new factory in Atlantic, Massachusetts. In addition to its present line of notions, raincoat cloth and hospital sheeting, the company will add carriage cloth, rubber heels and soles and other molded goods, possibly including sundries later. The new location affords excellent rail and water shipping facilities.

John H. H. McNamee, of the Bay State Insulated Wire Co., Hyde Park, Massachusetts, recently secured a charter for the operation of a new banking concern, to be known as the Prudential Trust Co., of which he is president. The new company is capitalized for \$200,000, already over-subscribed. The only other member of the rubber trade identified with its management is John E. Green, of the Green Electrical Co., who is vice president and a member of the executive committee. The Prudential Trust Co. will be located in the vicinity of Summer street, Boston, and will be open for business in July of this year.

The Boston Yarn Co., which specializes in fabrics for the tire trade, has moved its offices from 161 Devonshire street to 60 Federal street, Boston.

At a luncheon recently given by the New York branch of the Thermoid Rubber Co., of Trenton, New Jersey, to the members and staff of the Weaver-Ebling Automobile Co., newly appointed agents for Nassau tires, J. O. Stokes, president of the Thermoid company, spoke on the policy of that concern; D. O. Pohlman, sales manager, discoursed on factory equipment and results given by Nassau tires in 1914, and J. N. Kirk, Jr., of the New York branch, described conditions in the local tire field.

The Knight Tire & Rubber Co., of Youngstown, Ohio, has opened a branch in New York, at 215 West Fifty-first street, in charge of L. I. Ris, who in the past has been associated with several of the tire manufacturing concerns. H. J. Woodward is eastern district manager for the Knight company, having general direction of the operation of the branches at Baltimore, Philadelphia, New York and Boston.

Rubber reclaimers met January 14 at an enjoyable dinner tendered the Rubber Reclaimers' Club by Mr. William T. Rodenbach, founder of that organization. The dinner took place at the Graduates' Club, New Haven, Connecticut, and the president of the club, Captain F. H. Appleton, and others present made speeches.

The Rubber Trading Co. are now located at 9 to 15 Murray street, New York—not in the Postal Telegraph Building, as stated in our January number, but in the adjoining building. Our previous remarks as to the excellent situation and spacious convenience of their new quarters call for no correction.

The Rotary Club assembled at the Hollenden, Cleveland, Ohio, on January 11, at a banquet. The post-prandial oratory consisted of a discussion of the rubber industry, in the course of which a demonstration of the construction of an automobile tire, from the raw material, was given. The difficulty of obtaining the product was particularly referred to by the speakers. As souvenirs of the occasion, the guests received paper weights in the form of a cross section of an automobile tire, furnished by the Harris Henderson Tire Co., of that city.

The plant at Plainfield, New Jersey, operated for several years by the Century Tire Co., but which has been idle for some time, has been acquired by the Standard Tire & Rubber Co., of Boston, hitherto engaged in the jobbing trade. The factory will be used to turn out a line of tires suitable for the trade thus developed. William Cronin, head of the Standard company, was at one time New England manager for the Diamond Rubber Co.

BOSTON RUBBER SHOE CO. TAXATION SUBJECT OF CITY APPEAL.

The city of Malden, Massachusetts, in which is situated the factory of the Boston Rubber Shoe Co., of Boston, has been sustained by the Board of Appeals in its protest in the matter of tax assessment against that corporation. The Tax Commissioner, in computing this company's tax for 1914 deducted an item of considerable amount for account receivable in New York, property situated outside the state being subject to taxation where situated. In the appeal it was contended that the law on this point had been erroneously interpreted by the Commissioner and that, the assessment against the corporation being too small, the city of Malden received a return less than that to which it was entitled.

THE SHOE WHOLESALE'S WINTER MEETING.

The winter meeting of the National Association of Shoe Wholesalers, held at the Copley-Plaza, Boston, January 9, was attended by several of the rubber men prominently identified with footwear manufacture. F. C. Hood, president of the Hood Rubber Co., of Watertown, Massachusetts, addressed the meeting and expressed satisfaction with the change in date of announcement of annual rubber discounts from January 1 to July 1, suggesting as a further reform the division of discounts into two classes—dull finished goods made to fit the feet (such as arctics, boots and lumbermen's overs), and bright finished goods made to fit leather shoes, which are subject to frequent changes in style.

The address by L. D. Apsley, president of the Apsley Rubber Co., of Hudson, Massachusetts, dealt chiefly with the export trade. He called attention to the fact that by supplying inferior goods at prices which European manufacturers are willing to accept for a superior article, unscrupulous dealers have ruined the American manufacturer's chances in certain markets. He declared that the sharp practices of exporters constituted the greatest obstacle to extension of the foreign trade of our manufacturers and made a strong plea for greater efficiency and integrity in export methods.

TO PROMOTE TRADE DEVELOPMENT.

The Rubber Research Corporation, recently organized under Massachusetts laws, was formed to assist the rubber trade in its line of development. That it is unique in province and scope is indicated by the following statement of its president:

"The field which this company intends to cover is a very broad one. For instance, if a party has conceived some idea in regard to rubber and wishes help in placing this on the market or developing it, we will do this. If a crude rubber plantation desires to place upon the market a crude rubber to satisfy any customer, we propose to help. If a manufacturer desires a crude rubber of a certain specific grade or form we propose to place him in a position to procure such rubber according to his ideas if possible. If a company about to be formed, or already formed, desires the help of experienced men to lay out their plant, or any part of it; to organize their working force, or any part of it; we propose to make it our business to do this for them. If a rubber manufacturer desires to make any special article, or has trouble to make an article which he can sell if made properly, we propose to take the responsibility of doing this for him.

"In other words, we will attempt to commercialize any problem that any manufacturer, person, or concern may wish to have us undertake."

The officers of the company, which has its headquarters at South Braintree, Massachusetts, are: David A. Cutler, president; R. C. Harlow, vice president, and J. H. Stedman, treasurer. Mr. Cutler has had long experience in rubber research work. He was recently associated with the Acushnet Process Co., New Bedford, Massachusetts.

CAPITAL STOCK CHANGES.

The Hood Rubber Co., of Watertown, Massachusetts, has increased its common stock from \$1,000,000 to \$2,000,000, and has issued \$150,000 additional preferred stock, to be sold at a price netting the company above par, the proceeds to be used for additional working capital.

A special meeting of stockholders of the Quality Tire & Rubber Co., of Hartsville, Ohio, was held on January 19, to authorize an increase of capital stock from \$75,000 to \$500,000, the end in view being an increase in productive capacity to 300 automobile tires per day.

The Falls Rubber Co., of Cuyahoga Falls, Ohio, has increased its capitalization from \$200,000 to \$300,000.

WAR ORDERS.

The New Brunswick, New Jersey, plant of the United States Rubber Co., has had a share in the war business received in this country, rush orders calling for January 15 shipment occupying this plant at top speed for three weeks without even a let-up on New Year's day.

Calvet Rosenthal, who arrived in New York, January 12, by the "Minnetonka" from London, representing himself as special agent for the French government, stated that he was authorized to purchase, among other things, 2,000,000 pairs of rubber gloves and 1,000,000 pairs of wire nippers, the latter to cut barbed wire and the former for protection against electric shocks.

Other orders reported include one for rubber shoes placed with the Boston Rubber Shoe Co., of Boston; a \$500,000 order for uniforms with the Kenyon Co., manufacturers of weatherproof garments, Brooklyn; 1,000,000 yards of duck—variously distributed; automobile trucks to a value of about \$18,000,000, and 200 war aeroplanes.

WHAT SHOE MANUFACTURERS SAY ABOUT RUBBER SOLES.

The tenth annual convention of the National Boot & Shoe Manufacturers' Association was held in New York, at the Hotel Astor, January 12-13. In discussing the use of substitutes such as fabric tops and rubber bottoms, it was declared that the purchasers of such shoes were not receiving value equal to that of all-leather footwear and, while the shoe manufacturers benefited by greater consumption, the increasing expenditure for shoes by the general public would latterly affect the manufacturers.

ELECTRICAL MANUFACTURERS TO ORGANIZE.

Representatives of a number of electrical manufacturing companies met last month in the Hotel Biltmore, New York, to discuss the formation of an organization of manufacturers, to deal with the commercial problems of the industry. R. K. Sheppard, of The B. F. Goodrich Co., Akron, Ohio, was chosen chairman of the meeting, and H. R. Sargent, of the General Electric Co., secretary. After some discussion it was resolved to place the matter of organization in the hands of a representative committee of 9, with instructions to report to a general meeting to be called on February 9, to which electrical manufacturers from all over the country would be invited.

The Semple Rubber Co., of Trenton, New Jersey, has adopted the design here shown as a label for use on all its tire tubes, being one of the first of the American rubber manufacturing concerns to make use of the new trade slogan. The Semple company makes inner tubes of two thicknesses, under the trade names Semco and Sedrala.



The Chester Rubber Tire & Tube Co., East Liverpool, Ohio, have made extensive repairs in their plant, which was shut down for several weeks for this purpose. With new machinery, including two new mixing machines, they expect to do a large business during the coming season.

TRADE NEWS NOTES.

Meyer & Brown, crude rubber brokers, of 35-7 South William street, New York, sent out an announcement on January 2 of the renewal of their partnership and their intention to carry on the business as heretofore.

The McGraw Tire & Rubber Co., of East Palestine, Ohio, is offering investors an opportunity to purchase \$500,000 of its 7 per cent. preferred stock. The company's earnings for the fiscal year ending November 30 are reported as \$308,578 in excess of those of 1913, amounting to \$594,136, and its net tangible assets, exclusive of good will, patents, etc., to be worth \$1,353,670. Its authorized capital stock is \$1,000,000.

The Gaulois Tire Corporation, of 49 West Sixty-fourth street, New York, states that shipments of Gaulois tires continue to arrive from Havre and Marseilles, France, as in the past, and that no price advances have been made on account of the war.

The Toledo Rubber Co., of Toledo, Ohio, has moved into new quarters, occupying now an entire large four-story building. This company, which was established 24 years ago, conducts a wholesale and retail business in all kinds of rubber and sporting goods. Its officers are E. C. Deardorff, president, and T. H. Deardorff, vice-president and treasurer.

A lecture on "Rubber from Tree to Tire" was recently delivered at the Seventh Church, Cincinnati, Ohio, by W. G. Brown, of the firm of W. G. Brown & Co., distributors of crude rubber, compounding ingredients, etc., of that city. This lecture was illustrated by moving pictures, 4,000 feet of film being required to show the processes through which the rubber passes from its collection to manufacture into finished goods.

A co-partnership under the name of Arnold & Zeiss has been formed by C. H. Arnold, Albert Zeiss and W. J. Kelly, to take over and carry on, on and after January 1, 1915, the business of the firm of Arnold & Zeiss, whose partnership expired by limitation on December 31. Heilbut, Symons & Co., of London and Liverpool, became at the same time special partners, continuing in the present firm the same financial interest that they had in the former concern.

The B. F. Goodrich Co., of Akron, Ohio, has brought from its factory at Colombes, France, millimeter solid tire molds to be used in the production of tires for army vehicles. The French factory of the Goodrich company is being operated by the Government, but under some disadvantage, about 350 of its former employes having joined the military forces.

Three new 10,000-ton vessels, costing about \$3,000,000, are being built for W. R. Grace & Co., of New York, who do a large business with South American countries, both in import and export lines.

A dinner was held on January 5 at the Hotel Astor, New York, to bring together the men who between 1900 and 1905 were members of the selling staff of the Hartford Rubber Works Co., of Hartford, Connecticut, and to form an organization to perpetuate their friendship. Ernst H. Brandt, Joseph Rental and Harry E. Field were responsible for the idea and the list of persons invited to the dinner contained 51 names.

The Paramount Rubber Co., of Trenton, New Jersey, has appointed The George D. Kramer Co., of New York, distributors in the Eastern States of its line of tennis and hand balls. The Paramount line includes ten varieties of hand balls, but the company has only recently entered the golf ball field, turning out this class of goods for the first time last summer. The process of manufacture is said absolutely to seal the high pressure of compressed air in the ball, leaving no avenue of gradual escape, thus eliminating all possibility of going soft or dead.

TRADE NEWS NOTES.

The Canadian-Connecticut Cotton Mills, Limited, manufacturers of fine Sea Island, Egyptian and Peeler cotton fabrics, have recently placed orders for additional looms and preparatory machinery. O. Butler, secretary-manager of the company, was elected at a recent meeting managing director of the Connecticut Mills Co. at Danielson, and will hereafter be identified with both companies. Mr. Fittz retains his connection as secretary of the Danielson plant. The general agent of this company is R. J. Caldwell, well known to the rubber trade of this country and Canada.

The Knight Tire & Rubber Co., of Canton, Ohio, have engaged Lester I. Rice, formerly with the Republic Rubber Co., to manage their new branch at 215 West Fifty-first street, New York. He will supervise the company's sales in eastern New York, New Jersey and the western section of Connecticut.

The Tire Sales Co., of Buffalo, New York, have a branch at 827 Main street, that city, which will be known as the Motor Tire Supply Co., with A. Greenbaum as proprietor. They will deal, at wholesale and retail, in factory seconds and low-priced guaranteed tires.

The Racine Rubber Co., of Racine, Wisconsin, reports a gratifying result of their last business year, during which they made net earnings sufficient to pay, thirty times over, their preferred dividends, besides a 1½ per cent. cash distribution on their common stock and a 50 per cent. stock dividend in November. They have arranged with the Manufacturers' Supplies Co., Philadelphia, to take over the entire distribution of Racine tires, throughout Pennsylvania, New Jersey and the Southern States. J. A. Winter will be in charge of the sales end, with headquarters at 1336 Race street, Philadelphia.

The Gibney Tire & Rubber Co., Conshohocken, Pennsylvania, have engaged the services, for their Detroit branch, of G. W. Tiffany, formerly with the Goodyear Tire & Rubber Co. in that city.

The Kansas Pure Shoe Law will be on trial as to its constitutionality on February 3, when argument will be heard in the Supreme Court of that State on a motion to advance the case of the Payne Shoe Co. against the attorney-general.

The National India Rubber Co., Bristol, R. I., started its mills on January 4 on full time and the 2,200 employees received the welcome news that sufficient orders were on hand to insure full time for at least six months.

A new tire factory is to be located at New Castle, Pennsylvania. E. N. Ohl, J. S. Rhodes, A. B. Berger and W. H. Schoen, all of Pittsburgh, are interested, and \$260,000 has been subscribed as capital. Large orders have already been given for machinery for the new plant.

The Savage Tire Co., of San Diego, California, recently reorganized its selling department, with H. W. Miller, formerly of the Knight Tire & Rubber Co., as sales manager; Lee Ijams as assistant sales manager, and R. R. Etichus in charge of credits. B. F. Wulff, Jr., has been appointed manager of the distributing branch at San Francisco, which includes in its territory northern California, Oregon, Nevada and the Hawaiian Islands.

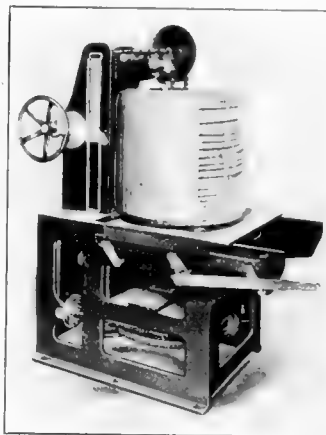
At the annual meeting of stockholders of the Chicago Rubber Clothing Co., held at Racine, Wisconsin, on January 23, the following were elected members of the Board of Directors: David G. Janes, George G. Bryant, E. V. Laughton, James Murphy, F. M. Knapp and C. E. Wells. The affairs of the company were reported to be in good condition, and the outlook for 1915 to be most promising. The directors elected the following officers for the ensuing year: D. G. Janes, president; George G. Bryant, secretary and general manager; E. V. Laughton, treasurer.

THE RUBBER CLUB EXPANDS.

One of the busiest offices associated with the rubber trade is that occupied by the Rubber Club of America, at 17 Madison avenue, New York. What with embargo work, the activities of the new divisions and the need of committee meeting rooms, it has been found necessary to add to the office force and to secure additional space.

A NEW PAPER WRAPPING MACHINE.

This machine is for wrapping bales of finished hose, tires or wire. It has a sliding table which is raised and lowered by a hand lever. The bale to be wrapped is placed on the table, which is pushed backward into proper position under the sliding head and then lowered so that it rests on the four revolving cones, automatically operated by a friction drive. This has an adjustable feed for any overlap desired.



A roll of paper is placed between the two sprocket chains and is carried down through the inside of the bale and up around the outside, thereby wrapping the paper strip around it as it is rotated by the cones. When the bale has been completely wrapped, the head is lowered by a hand

wheel, which slackens the sprocket chain so that it can be unhooked. The table is then raised, pulled forward and the bale removed, ready for shipment.

The actual time required to wrap a bale of garden hose 24 inches high with an inch and a half overlap is a minute and a half. One man is capable of running 3 machines, which accomplish as much as 6 men wrapping with burlap in the old way. [Terkelsen & Wennberg, Boston.]

MOTZ TAKEN OVER BY THE GOODYEAR.

The business of the Motz Tire & Rubber Co., of Akron, Ohio, 50 per cent. of whose stock is owned by the Goodyear Tire & Rubber Co., will, after February 1, be conducted as a department of the latter concern.

The Motz company was incorporated in April, 1905, with a capital stock of \$50,000, to manufacture tires. In our issue of



MOTZ CUSHION TIRE.

December, 1913, page 142, a dual tire of the Motz cushion type was shown, and the accompanying cut illustrates the single tire of the same type. These tires have been made for the Motz company in the Goodyear Tire & Rubber Co.'s cushion tire department.

RUBBER CLUB MEETINGS AND MEMBERSHIP.

AT the regular quarterly meeting of the Executive Committee of the Rubber Club of America, held at the Union League Club, New York, January 5, 1915, ten new members were elected, list of whom, with firm representatives, follows:

FIRM MEMBERS.

Acme Rubber Manufacturing Co., Trenton, New Jersey—J. A. Lambert
 Ajax Grieb Rubber Co., Inc., 1796 Broadway, New York—William G. Grieb.
 Bishop Gutta Percha Co., 420 East Twenty-fifth street, New York—Henry D. Reed.
 Braender Rubber & Tire Co., Rutherford, New Jersey—W. P. Braender.
 Combination Rubber Manufacturing Co., Bloomfield, New Jersey—Fred L. Conover.
 Dryden Rubber Co., 1014 South Kildare avenue, Chicago—George B. Dryden.
 Howe Rubber Co., New Brunswick, New Jersey—John J. Tenney, Jr.
 Keystone Rubber Manufacturing Co., Erie, Pennsylvania—J. G. Moomy.
 Mattson Rubber Co., Lodi, New Jersey—J. H. Behrens.
 Western Rubber Co., Goshen, Indiana—G. B. Slate.

ACTIVE MEMBERS.

Myron Henry Clark, United States Rubber Co., 1790 Broadway, New York.
 John Morgan, vice-president and treasurer, McGraw Tire & Rubber Co., East Palestine, Ohio.
 The H. O. Canfield Co., of Bridgeport, Connecticut, authorized the transfer of their active membership to firm membership, with A. H. Canfield as firm representative.
 R. L. Chipman, of 25 Beaver street, New York, authorized the transfer of his active membership to firm membership.
 The B. & R. Rubber Co., of North Brookfield, Massachusetts, have authorized the transfer of their active membership to firm membership, naming T. G. Richards as firm representative.

The following is a list of former members of the Mechanical Rubber Goods Manufacturers' Association who have come into the Rubber Club of America:

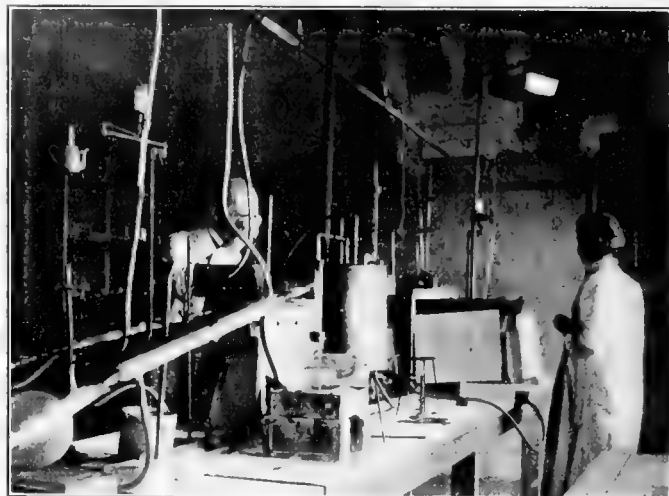
Beck, William and Charles, Lawrence, Massachusetts—Alfred Beck, firm representative.
 Bowers Rubber Works, San Francisco.
 C. C. C. Fire Hose & Rubber Co., Boston.
 Cornelius Callahan Co., Boston.
 Continental Rubber Works Co., Erie, Pennsylvania—Theron R. Palmer, firm representative.
 Crescent Insulated Wire & Cable Co., Trenton, New Jersey—C. Edward Murray, firm representative.
 Canadian Rubber Co., Montreal, Quebec.
 Eureka Fire Hose Manufacturing Co., New York.
 Empire Rubber & Tire Co., Trenton, New Jersey—C. Edward Murray, firm representative.
 Gutta Percha & Rubber, Limited, Toronto, Ontario.
 Hewitt Rubber Co., Buffalo, New York—H. H. Hewitt, representative.
 Mechanical Rubber Co., Cleveland, Ohio.
 Niedner's Sons Co., Charles, Malden, Massachusetts.
 New Jersey Car Spring & Rubber Co., Jersey City, New Jersey—John J. Fields, firm representative.
 New York Belting & Packing Co., 91 Chambers street, New York—J. H. Cobb, firm representative.
 Peerless Rubber Manufacturing Co., 16 Warren street, New York—Charles A. Hunter, firm representative.
 United & Globe Rubber Manufacturing Cos., Trenton, New Jersey.
 Voorhees Rubber Manufacturing Co., Jersey City, New Jersey—John J. Voorhees, firm representative.

After the regular meeting a joint session of the Executive Committee and the Embargo Committee was held. Reports of the Embargo Committee's work in Washington were read, special mention being made of the prompt and efficient assistance rendered by the British Ambassador.

A meeting of the Mechanical Rubber Goods Manufacturers' Division of the Rubber Club of America is to be held in New York on Tuesday, February 16, 1915.

ALEMBIC RUBBER.

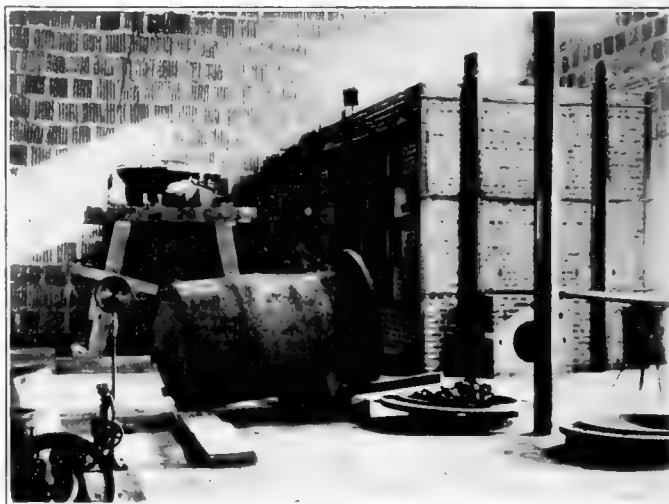
TWO exceedingly friendly and good-looking young men called at THE INDIA RUBBER WORLD office the other day, by request, with the story of the new "Alembic" rubber that is about to be manufactured in Perth Amboy, New Jersey, by the Alembic Process Co. Whether or not they are one day going to be able



LABORATORY OF ALEMBIC PROCESS CO.

to really produce synthetic rubber in commercial quantities we do not know, but they certainly believe it.

Their story is that 10 years ago a German chemist, familiar with synthetic work at Elberfeld, came to this country and, in the attempt to manufacture synthetic rubber by a process of his own, spent a fortune of something like \$50,000. Incidentally, an explosion in his factory killed his wife, and a later one killed his chief assistant. Not discouraged, he started again to manufacture, this time dispensing with the high pressures that hitherto had proved so disastrous. The result was, so his assistants claim, a gum which looks very much like a fair grade of guayule, which is produced at a cost of 12 cents per pound. There is also



FURNACE ROOM AT PERTH AMBOY.

a by-product which has a ready market in soap manufacture.

The present equipment, which is said to be very simple, allows the production of something like 18 pounds a week. The company has filed a brevet on its process and product and is seeking capital to put in more machinery, so as to be able to turn out from 1,000 to 6,000 pounds a day. The base from which the so-called rubber is made is said to be turpentine.

THE RUBBER TRADE IN AKRON.

By Our Regular Correspondent.

OPTIMISM has been restored in local rubber circles now that arrangements have been made for adjustment of English regulations affecting the shipping of rubber. Officials of the Akron rubber companies, including A. H. Marks, general manager of the B. F. Goodrich Co., H. S. Firestone, of the Firestone Tire & Rubber Co., and P. W. Litchfield, of the Goodyear Tire & Rubber Co., in interviews this week, expressed confidence in an early revival of trade. While this city has felt the business depression affecting practically every industrial center of America, during the past six months, conditions are gradually improving and by the first of April will probably be restored to normal. The depression has not had the effect upon Akron that other cities of the same class in this section of the country have experienced and the number of unemployed here is much less than in neighboring cities.

* * *

One hundred salesmen of the boot and shoe department of The B. F. Goodrich Co. attended the first of a series of five winter sales conventions in Akron the second week in January. Social and business sessions covering three days marked the convention.

Frank Kenton, a Goodrich company foreman, and three other employees, sailed January 19 for Paris, France, where they will join the allied armies' crew of tire repair men. It is said that an effort will also be made by Goodrich officials to regain control of the French branch factory of the company which was commandeered by the French government at the beginning of the European war.

Dr. C. E. Smith will be in charge of the department of dental inspection to be opened by this company February 1. Lectures on the importance and care of the teeth and instructions on caring for them will be given by Dr. Smith in all of the departments, in which more than 10,000 men are employed. The Goodrich is the first big industrial institution in this section of the country to establish a dental inspection department.

Diamond tires made a successful addition to their list in "Squeezee," the new non-skid tread Diamond. The tread is made up of three continuous ribs, with cross-bars, and like its namesake, it clings so closely to wet and slippery pavements as to offer sturdy opposition to skidding either forward or sideways.

Plan No. 26 of the Goodrich Company is to have an addition, a permit having recently been granted by the building department of the city for the erection of such a structure, two stories high and costing \$5,000.

The B. F. Goodrich Co. and the Firestone Tire & Rubber Co. are included in the list of Akron industrial concerns which are affected by the increased rates for use of State water. The companies have appealed from the decision of the State Superintendent of Public Works, but after receiving an opinion from Attorney General Turner, Governor F. B. Willis decided that the rate increases were legal and declined to interfere.

The largest check for taxes ever received by the county treasurer of Summit county was received the second week in January from the Goodrich company. It was for \$148,000.

John R. Gammeter and The B. F. Goodrich Co. have lost their right in the Court of Appeals of the District of Columbia for ownership of patent rights on a head placing ring. After four years of litigation the DeLaski & Thropp Co., of Trenton, New Jersey, was awarded the claim. Priority of filing of patent claim was the point involved in the suit.

The Miller Rubber Co., by a two-story, fireproof, brick addition to their plant, have provided for an increase of 1,000 tires in their daily output. A three-story 40 x 110 feet warehouse is being built, also a 50 x 100 extension to the rubber drying room. The additional factory space, including a new shipping depart-

ment built on adjoining property recently purchased, will total 272,905 square feet, or about 6 1/2 acres, and a 2,000 horsepower plant is also being installed for operation purposes.

* * *

Firestone Tire & Rubber Co. converted 12,000 tons, or 24,000,000 pounds, of steel into Firestone rims last year. Contractors estimate 1,000,000 pounds as a liberal allowance for a fairly large building. A working floor space of 150,000 square feet, a force of 400 men and a fine equipment of machinery, including 16 electric welders, find employment in this branch. Firestone rims will be used exclusively this year by sixty automobile manufacturers.

H. S. Firestone, president of the company, in an address before members of the Cleveland Advertising Club, Thursday, January 21, told how rubber trees are grown and cared for and how rubber is transformed from the crude state into the finished product. Stereopticon pictures illustrated the lecture.

Mr. Firestone and other officials of the company attended the factory ball recently given by employees at an Akron dancing academy.

Hanging to a fire escape, four stories above the ground, Jerry Phelps, an Akron man, reached through a window at the Firestone Tire & Rubber Co. plant not long ago, and pulled out more than \$200 worth of auto. tires which he threw to a companion. The men were arrested and bound over to await action of the Grand Jury.

The Goodyear Tire & Rubber Co. recently made public a statement showing the growth of their pneumatic tire production for the past six years. In 1909 they made and sold 102,669 tires, and this number has shown a steady yearly increase, until in 1914 the number of Goodyear tires made and sold was 1,478,396. The demand for the company's pneumatics for heavy motor trucks is likely to further increase these sales. The company is now supplying a 38 x 7 inch tire with a rated carrying capacity of 2,500 pounds, a 42 x 9-inch carrying 4,500 pounds per tire and a 48 x 12-inch of 7,500 pounds carrying capacity per tire. All are of the No-Rim-Cut type and conform to the company's Ideal Detachable Rim, '07 profile. This company last month entertained the selling force of Morley Bros., who handle their goods at Saginaw, Michigan. The party were the company's guests from the 12th to the 16th ult., and were afforded an opportunity to inspect the big plant and attend the school of instruction for Goodyear salesmen.

President F. A. Seiberling, of the Goodyear company, and Mrs. Seiberling are now in London arranging for decorations for their new home on Portage Path, one of the finest in this section of the country. They will return to Akron early in February.

William Upson, former Akron attorney and father of Ralph H. Upson, world champion balloonist, of the Goodyear company, is helping to nurse wounded soldiers in a war hospital at Bagueres de Bigorre, France. He was traveling in France at the beginning of the European war.

According to Jos. Dangel, general factory superintendent of the American Hard Rubber Co., Akron is the only city in the world which boasts a plant successfully manufacturing hard rubber bowling balls. The Akron balls are made entirely of rubber. Mr. Dangel is one of the expert bowlers in this section of the country and it is due to the study he has given the manufacture of the rubber balls that they have been such a success.

Akron rubber companies exhibited at the Ohio Industrial Safety First Exposition at Columbus the second week in January. W. N. Fitch, safety director of the Goodrich, and R. E. Lee, safety director of the Firestone, were among the speakers.

THE RUBBER TRADE IN BOSTON.

By Our Regular Correspondent.

THE new year has not yet filled the anticipations of the optimists in the trade. Manufacture has not advanced any considerable extent and there are traces of disappointment in the reports which come from members of the trade. However, there has been an improvement, of greater or less extent, in nearly every branch of the business, and the prospects are for continued advance. The call for mechanicals is quiet; the tire manufacturers are doing a fair business; druggists' soft goods are being called for moderately, and there is some movement in clothing. The weather should help this branch, for rain and snow have been plentiful. In boots and shoes the weather has brought a demand, which had been to some extent provided for. The factories making tennis shoes are busy and adding to their production as fast as help can be secured.

* * *

The tennis shoe question is an interesting one at present. Leather shoes are high, and likely to further advance in price. Shoe dealers in many sections, and especially in the South, anticipate a big call for tennis shoes to take the place of leather shoes, which are or will be too high for certain classes of trade.

* * *

The substitution of rubber for leather in soles grows in importance each month. Sole leather is going abroad for manufacture into shoes for the soldiers, and foreign buyers are willing to pay such prices that American shoe manufacturers find quotations so high that they are turning their attention to substitutes, and most of these substitutes are of rubber, either alone or mixed with fibre, etc. It's a poor month when a new soling of rubber is not exploited in the shoe trade.

One great objection to the use of these soles has been the necessity of stitching with holes rather widely apart, and the use of heavy, coarse thread, so that the rubber will not tear between the holes made by the needle. Such stitching and thread are appropriate only in outing and sporting shoes, and similar lines, and is neither desirable nor practicable for women's fine shoes with high arch insteps and narrow edges. How to overcome this heavy appearance and to give the touch of fine shoemaking without weakening the shoe by cutting the sole at the stitching is a problem which has occupied the minds of several inventors. A Lynn shoe manufacturer, Karl A. Stritter, of Strout & Stritter, claims that his invention will accomplish this. He has applied for a patent, the details of which are not yet fully available, but which are, in effect, a leather welt or reinforcement cemented on, and extending around the edge of the rubber sole in such way that the stitching goes through both rubber and leather, the latter holding the stitches and preventing the splitting of the rubber sole between the needle holes. This gives such protection to the rubber sole that it may be given any desired "edge," and makes it practicable to withstand the strain subjected by high-heeled shoes. If this is really effected, there is almost a certainty of a large increase in the use of rubber soles on women's shoes, for many women would wear these more stylish shapes who will not wear the present low-heel, heavy-edged, rubber-soled shoes. Samples which have been shown in Boston the past month are fully as stylish, slender and shapely as those made with leather soles.

* * *

Frank W. Whitcher, of the F. W. Whitcher Co., manufacturers of the Velvet Rubber Heel and other specialties in rubber, is an ardent champion of fixed prices on advertised articles, and has addressed several conventions and associa-

tions on this important subject. He claims that manufacturers should be allowed to control the prices at which their articles are sold, either by dealers or wholesalers. Until the decision in the Sanatogen case some months ago, manufacturers were so controlling the selling price, but this decision renders such control illegal. There are many hundreds of articles manufactured of rubber which are widely advertised, and on which a standard price has been fixed. But if these articles are sold at cut prices, the manufacturers must either reduce the cost of making or quit advertising, either horn of the dilemma being suicidal. Surely this is a subject worthy of careful consideration, and should be agitated to influence legislation in favor of fixed prices, as a protection to manufacturer, wholesaler and retailer.

THE RUBBER TRADE IN CHICAGO.

By Our Regular Correspondent.

THE first weeks of the year in the rubber trade here have met with the entire satisfaction of the members. Owing to the fact that the month has contained a great deal of bad weather, the rubber clothing houses have been doing a rush business. When the storms arrived the dealers in raincoats and rubber shoes soon ran out of stock and were obliged to replenish from local distributors. These houses were well prepared for the rush, and goods were sent out in expeditious fashion.

Rubber belting houses have not been so busy, of course, as the main rush for them is over until spring. However, there has been a good average demand. Most of these firms carry tires, packing and other mechanical goods, so that when one line is out of season another can take its place. The demand for tire inners has been good, say the mechanical rubber goods men. They also declare that they are receiving orders in fair volume for packing from coal and copper mines in the west and northwest.

* * *

The tire men made great preparations for the annual automobile show, held in the Coliseum and the First Regiment Armory, January 23-30. Some of the firms, of course, have large displays. These are located on the balcony, along with the other supply exhibits. Large crowds are attending the show this year, as the event has been given more than the usual amount of publicity in the newspapers.

* * *

R. H. Abernathy, of the Brazil Rubber Manufacturing Co., 18 South Dearborn street, expresses himself as well pleased with the trend of business for the past month and looks for a good spring season.

* * *

Rubber manufacturers of this city are much interested in the fight which is being made by Chicago manufacturers to secure lower freight rates on carload shipments to the Pacific Coast.

Last week Thomas C. Moore, representing the Merchants' Transportation Bureau, appeared before the Western Classification Committee, which met here, and told the members and a number of railroad officials present exactly what the manufacturers of the city, including the rubber men, wanted in the way of reduced rates.

"Under present conditions," said Mr. Moore, "the manufacturer of a product in New York, Boston, Philadelphia, or any of the other cities on the Atlantic seaboard can actually ship goods by water via the Panama Canal cheaper than the manufacturers of this city can send them to the Pacific Coast by rail. What is more to the point, the steamship companies can make the trip in only a few days' more time. Chicago manufacturers believe that this competition is not fair, and they want a substantial reduction on carload rates to the coast."

The committee refused to touch the matter, however, until they had received some idea of the stand of the Interstate Com-

merce Commission. Railroad men present said that they believed the railroads would not oppose a reduction, but stated that it would not be possible to reduce the trans-continental rates without reducing the inter-mountain rates at the same time. This would bring about serious complications, they said, which would require the attention of the Interstate Commerce Commission.

As a result of this stand Mr. Moore said that the matter would be brought to the attention of the Interstate Commerce Commission at Washington.

* * *

Figures which have been compiled by the newspaper bureau show that rubber goods were handled (in a jobbing way) in Chicago during 1914 to the extent of \$9,675,000, compared with \$12,900,000 for 1913. This is something of a falling off, though some other lines of business show a much greater loss.

* * *

The Canton Rubber & Manufacturing Co., 143 North Dearborn street, have just completed their inventory. They state that the new year has started in in a manner that meets with their entire satisfaction.

* * *

M. S. Curven, of the Boston Belting Co., 172 West Randolph street, said in a recent interview that business has been good and he believes the rubber trade of the West to be in a very healthy condition.

* * *

Business at the Quaker City Rubber Co. has been rushing for the past month or so, shipping packing to the coal mines. There have been few strikes or other labor troubles resulting in the closing down of mines this winter,

which has been a good thing for the mechanical rubber goods houses of Chicago. The vast coal and copper mines within reach of Chicago look to this city as a natural source of supply and, of course, when they close down it means loss of business to local dealers.

A method of attaching vulcanite to aluminum is described in a recent issue of the "Dental Record" that will undoubtedly prove of interest to dentists. It would furnish a means whereby the vulcanite portion of a denture could be permanently attached to an aluminum plate, making an exceptionally light and in every way excellent equipment. The process consists in coating the cleaned aluminum surface with a thin solution of rubber in chloroform. Over this, when dry, is carefully packed a layer of weighted rubber and the further filling of the mold space is completed with ordinary rubber. It is claimed that by this means a stable union between vulcanite and aluminum is effected.

Replete with information for rubber manufacturers.—Mr. Pearson's "Crude Rubber and Compounding Ingredients."

THE RUBBER TRADE IN TRENTON.

By Our Regular Correspondent.

THE Trenton rubber manufacturers were not particularly worried over the threatened continuation of the English embargo on crude shipments. For the most part the Trenton plants have abundant supplies either on hand or en route and they would not have been seriously interfered with in the manufacturing end unless the embargo had continued for a considerable length of time. At least one of the Trenton factories was actually benefited by the embargo talk. As soon as the newspapers printed the story of England's ruling on the rubber question this factory received a number of rush orders by telegraph. The customers anticipated their needs for months to come and wanted to make sure that their orders were filled before the supposed raise in price took place.

The accompanying illustration of the new plant of the Essex Rubber Co., at Trenton, tells more graphically than words of the remarkable success of this steadily growing concern.

Less than 7 years ago a small, one-story building was adequate to take care of the company's manufacturing department,

and it also afforded an 8 by 12 office room. A representative of THE INDIA RUBBER WORLD on a recent visit to the plant found a corps of bookkeepers, order clerks, stenographers, etc., busily engaged in an office occupying more space than the combined office and factory contained in the original building.

In the private office of President C. H. Oakley hangs a neat, black frame containing,



PLANT OF THE ESSEX RUBBER CO., TRENTON.

under date of April 29, 1907, the first order the company ever received. Mr. Oakley looks upon this as "the baby of the house" and he cherishes it as tenderly as a father his first-born. It was not until a year after the receipt of this order that the company leased the modest little structure referred to above. A wagon load of coal was obtained from a trustful dealer (who, by the way, still supplies the plant with its fuel) and the fires were lighted in May, 1908. Several mills, a calender and one hydraulic press constituted the original equipment. About \$9,000 worth of rubber goods were sold during the balance of the first year. When it is stated that the sales of the company for the year just closed totaled close to \$1,000,000 one can appreciate with what rapid strides the concern has forged ahead. The profits of the business have been devoted to the upbuilding of the plant.

The new mechanical equipment consists of 1,500 h. p. of Edgemoor water tube boilers, 2 Greene engines of 1,000 h. p., 400 kilowatts of electrical energy for lighting and motive purposes. Eighteen 54-inch mixing mills, 3 calenders, 2 of which are electrically driven, tubing machines and vul-

canizers are required for manufacturing purposes. The company's complete building plans include a three-story brick office building and a reclaiming plant not yet completed.

The company manufactures soles and heels for the shoe trade and claims to produce more rubber soles than any other concern in America. In addition to this important branch of the business, which occupies a most complete vulcanizing press room 60 x 200 feet, the concern makes automobile accessories, sporting goods, asbestos and rubber packing, asbestos brake linings, horseshoe pads, "Soft Spot" heel cushions and all sorts of mechanical and molded goods except belting, hose and tires. Two years ago a hard molded insulating department was formed to make Essex-Condensite, used as an insulating material by makers of electrical appliances and automobiles, in ignition systems and for the covering of automobile steering wheels.

The Essex company operates its own pattern, carpenter and machine shops and employs 400 hands.

The officers are C. H. Oakley, president and general manager; W. F. Bainbridge, vice-president and New England sales manager; Owen Moon, Jr., treasurer; A. E. Moon, secretary and assistant treasurer.

* * *

The Ajax-Grieb Rubber Co. is working 24 hours a day, with three relays of operatives, in an effort to take care of the rapidly increasing demand for Ajax tires. Louis P. Destribats, general manager of the factory, stated to THE INDIA RUBBER WORLD correspondent that even with the great output made possible by this factory arrangement the company will be taxed to take care of its trade.

* * *

John S. Broughton, of the United & Globe Rubber Cos., who recently returned from an extended trip throughout the South and West, reports that the outlook for spring business is gratifying, particularly in the western market.

* * *

The Lambertville Rubber Co. has resumed operations after having been shut down for three weeks for stock taking and repairs. This concern's line of rubber boots and shoes finds a steadily increasing demand throughout the country.

* * *

The Luzerne Rubber Co. has moved into its newly completed building, which affords accommodations for its office department, shipping and inspection rooms. The plant throughout has been practically doubled in capacity and new and up-to-date machinery has been installed. The old steam system of motive power has been replaced by electricity, with individual motors attached to machines.

* * *

Fire, which did damage to the amount of \$1,500,000, wiped out the insulated wire department of the John A. Roebling's Sons Co. at Trenton January 18. The blaze started in a mysterious manner in the shipping department about 7 o'clock in the evening while several hundred men were employed in various parts of the plant.

Owing to the fact that some materials were being manufactured supposedly for use in the French army the rumor gained ground that a German spy had caused the fire. F. W. Roebling, secretary-treasurer of the company, said he gave no credence to the report.

The fire destroyed not only the huge plant in which the insulated wire business of the company was conducted but also a long row of residences, and came alarmingly near spreading through the plant of the Home Rubber Co.

The fire brigade of the Home Rubber Co. remained on duty all night and several incipient blazes along the windows and roof of the plant were put out. An automobile chemical engine was stationed alongside of the Home plant and the flames swept so close that it was necessary to drag it away

with the aid of a locomotive, which serves to illustrate the dangerous position of the company's property.

About 1,000 operatives were thrown out of employment by the destruction of the Roebling plant and many of these suffered the further affliction of losing their homes. In addition to the total loss of many thousands of dollars' worth of



INTERIOR VIEW OF INSULATED WIRE DEPARTMENT.

special machinery, large quantities of finished product were consumed by the flames.

The Roebling wire department was a model in fireproof construction. It had practically a complete inner lining of clinched metal protecting walls and ceilings. The elevator shafts were absolutely "fire proof." Self-closing doors, a supposedly adequate sprinkler system, a well organized shop fire department equipped with chemical carts, hose, extinguishers and other apparatus of the latest design, had rendered the plant theoretically immune from the very element by which it was destroyed.

There was only about \$300,000 insurance on the building and machinery of the Roebling company. F. W. Roebling said after the fire that the company would rebuild at once. No large building will replace the burned one but a number



EXTERIOR VIEW OF INSULATED WIRE DEPARTMENT.

of smaller structures will be erected so that the disaster cannot be so complete should fire again visit the plant. The mayor of Elizabeth, New Jersey, and the president of the Board of Trade of that city visited Trenton after the fire and tried, without success, to induce the Roeblings to locate their insulated wire department in that place.

THE RUBBER TRADE IN RHODE ISLAND.

By Our Regular Correspondent.

THERE has been a gradual but on the whole a substantial improvement in the condition of business among the rubber factories in this vicinity during the month. While appreciating the possibilities of the European embargo on rubber, the local manufacturers have continued optimistic and have conducted their plants along conservative lines with hopes of a modification before their stocks of crude material should become exhausted.

There are evidences on all sides of an increased volume of business. The factories making boots and shoes have been favored by the weather conditions so far. Other lines of the industry have also enjoyed encouraging activity, and all anticipate steady employment for some time to come.

* * *

A trial is now being conducted before Judge Arthur L. Brown, in the United States District Court in this city, of Edward P. Metcalf, former president of the suspended Atlantic National Bank, and others, for alleged misapplication of the funds of the bank. At the time the Walpole Tire & Rubber Co. was forced into the hands of a receiver, following the suspension of the Atlantic National Bank, it was stated that the financial difficulties of the bank had entered materially into the embarrassments of the Walpole company. The affairs of the Walpole company have progressed slowly to the point of selling the plant and business, but the date of sale has been repeatedly postponed from time to time, and recently was again set for March 10, at 11:30 a. m.

Business has been rather quiet in some of the departments of the Washburn Wire Co.'s plant at Phillipsdale, and advantage has been taken for overhauling, repairing and general improvements. The waste heat boilers recently installed in the open hearth department are undergoing thorough tests.

Charles R. Remington, general manager of the company, was confined to his home in North Seekonk, Massachusetts, for some time the past month by severe illness.

The factory of the National India Rubber Co., at Bristol, resumed operations on Monday, January 4, with sufficient orders for footwear on the books to give steady work to at least 2,000 employes during the remainder of the winter. During the shut-down the main portion of the plant underwent thorough and extensive repairs, and a fine system of stop levers was installed, under the direction of Vice-President LeBaron C. Colt, to prevent accident to the employes at the calenders and grinders.

One of the most important changes was the removal of all the sewing machines numbering over 300 to a room in the building which was formerly used for a store house. There are also being installed 140 additional sewing machines, which will make a total of 440 in use. When everything is completed the company will employ a larger number of hands and turn out more rubber footwear than ever in its history.

Superintendent James W. Franklin, of the National company was pleasantly remembered Christmas by the employes of the shoe department, when he was given a large and handsome cut glass punch bowl.

*

The plant of the International Rubber Co. at Barrington has been working with double shifts in most of its departments for several weeks, and there are orders enough on hand to keep up the present pace for some time to come.

* * *

Terrence McCarthy is carrying on an active business in the manufacture of tennis shoes and arctics at his factory—formerly the Consumers' Rubber Co. at Bristol. Mr. McCarthy,

who was connected with the former management for a long time and later was receiver of the Consumers' company, is operating his plant to capacity and, it is understood, has orders on his books sufficient to keep it engaged on full time for several weeks to come. The increased activity in the plant has called for an increase of help in the office departments.

The big plant of the American Wringer Co., on Social street, Woonsocket, resumed operations on January 4 after a ten days' shut-down for the purpose of taking the annual account of stock and to make an overhauling and repairing of machinery, boilers, engines, etc. While the plant was closed the boilers were given especial attention. General Manager M. M. Flynn states that the plant has resumed operations with encouraging prospects for steady work for some months to come.

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The plant of the Davol Rubber Co., on Point street, Providence, has been gradually resuming a full-time schedule in its numerous departments during the past few weeks, so that the entire establishment is now running practically to its capacity. It is reported that the company has recently been in receipt of several large orders for surgical goods which are to be used by the Allies in their field hospitals.

FEDERAL COURT HOLDS STATE TIRE CORE PATENT INVALID.

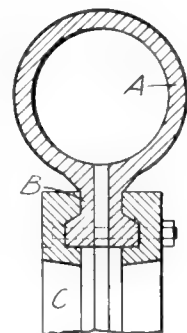
A DECISION of great importance to manufacturers of detachable tires, and tire core manufacturers, has just been rendered by Judge Dodge of the United States District Court for the District of Massachusetts, in the case of the Goodyear Tire & Rubber Co. vs. the Hood Rubber Co., holding invalid all of the claims of United States patent 865,064, granted September 3, 1907, to Will C. State, and now owned by the Goodyear company.

This patent covers the core shown in the accompanying illustration. It is made with a plurality of segments that abut against each other. It has beaded inner flanges and two rings channeled to fit them. The sections are assembled and bolted firmly together by the rings.

It was asserted by the plaintiff in the suit that the State patent covered all types of cores, used in the manufacture of detachable tires, having substantially non-extensible edges and comprising a plurality of independent sections held in ring formation by one or more rings overlapping the inner portions of the sections.

The court found that, prior to the invention of this core by State, substantially the same construction had been in commercial use at the plant of The B. F. Goodrich Co., of Akron, Ohio, and had also been in general use by the Fisk Rubber Co., of Chicopee Falls, Massachusetts, in the manufacture of detachable tires, having substantially non-extensible edges.

The suit just decided was filed December 5, 1910. Another suit on the same patent brought by the Goodyear Tire & Rubber Co. against the Ajax-Grieb Rubber Co., of Trenton, New Jersey, is now pending in the United States District Court for the District of New Jersey.



A—Core.
B Beaded Flanges.
C Clamping Rings.

The Taunton Rubber Co., Taunton, Massachusetts, has moved into its new factory on East Whitehill street. J. L. Gifford, sales manager, is very optimistic over the future prospects of the business.

The India Rubber Trade in Great Britain.

By Our Regular Correspondent.

AT no time since the embargo on rubber was instituted have such sanguine views been held as to its early removal. Mincing Lane appears to be convinced that the cancellation of the export prohibition is only a matter of days, or even hours, and plantation rubber has already risen several pence per pound in anticipation. Incidentally, the hard Para market has weakened. It may be that in the existing optimism there is a trace of the wish being father to the thought; but there is in reality a far more potent reason. A few days ago it was unofficially reported that President Wilson had ordained the certification of the exact contents of American cargoes before they leave port. This is the foundation upon which current hopes are based, for it is contended that, if the report be true, the entire question at issue between the two countries will be automatically solved. Obviously such a course would do away with the necessity of searching ships at sea, for it may be assumed that if manifests are declared before sailing the shipping of contraband must cease. It is thought that the British government sought to use the rubber embargo as a lever in the negotiations respecting commerce conditions between the two countries and the view is that it has proved very effective. But, pending confirmation of the report referred to, the market must be content to wait and hope. As has been stated before, the prolongation of the embargo, indefinitely, would give rise to some very serious problems in the plantation industry, not the least of which is the possibility of trouble with the imported Indian labor on the rubber estates.

Meanwhile it must be confessed the importers have taken the situation very philosophically, in which they are supported by the fact that hitherto the market has kept its end up remarkably well in circumstances which might have been calculated to knock the bottom out of it. In this the situation has been helped by the fact that owing to shortage of labor at the docks the landing of rubber cargoes is proceeding very slowly. Thus, although supplies at hand are undoubtedly large, the actual stocks on land do not indicate anything abnormal. Another noteworthy point is that, despite the embargo, there is no sign of diminished production in the Orient. On the contrary, the crop returns for last month show substantial increases all along the line.

RUBBER "ARMOR PLATE" FOR WARSHIPS.

Not only has the war proved the best advertisement that rubber has ever had, but it has been the means of bringing to the fore several interesting inventions in which rubber plays an important part. One of these consists of rubber plates for the protection of battleships against the attack of mine or torpedo. Mr. Louis P. Bowler, the inventor, claims that 4 to 6-inch rubber plates attached to a 1½ inch armored ship will withstand the explosive force of any torpedo or mine in present use. He contends that heavy steel armor plate is useless against the attack of the modern submarine and points to the losses sustained in the present war as proof of his argument. It is common knowledge, in regard to explosives, he observes, that when a ponderous floating mass, such as is presented by a huge battleship, offers solid steel-faced resistance to the explosive shock of the torpedo, something has to go. The hardened steel is a non-absorber of concussion, and its only influence is that of repelling. The effect of this same terrific force directed against a tough, unbreakable, yielding and resilient body such as rubber or gutta-percha is the exhaustion and absorption of the striking

force or concussion. The inventor once witnessed the explosion of 1½ hundredweights of dynamite on a 2-inch rubber flooring, which resulted in everything being blown away except the rubber, which had a scorched surface extending over 4 feet with several holes caused by burning. The tendency of dynamite is to strike downwards, the heat being the most destructive agent where rubber is concerned; but this effect would be considerably reduced in cases of explosion in water.

The idea, briefly outlined, having been brought before the Rubber Growers' Association, that body has made a proposition to the Admiralty to supply, free of cost, the rubber necessary for covering a trawler mine-sweeper. The expense of covering a battleship with rubber plates would, of course, be very great, for it is asserted that the cost of covering a 120-foot mine sweeper would be from £12,000 to £15,000. Nevertheless the cost would not be disproportionate if the device were effective in saving battleship crews, not to mention battleships themselves.

ACTIVITIES OF THE RUBBER GROWERS' ASSOCIATION.

It will be recollected that some months ago the Rubber Growers' Association made representations to the government with a view to supplying the British troops operating in wet trenches with rubber boots. Although their efforts in this direction have not yet been crowned with success, the association has been asked to equip the Royal Flying Corps with rubber boots and is now preparing to comply with the request. Besides the 1,000 hot-water bottles supplied by the association to the British Red Cross Society, large numbers of similar bottles, provided out of the Hospital Flooring Fund, have been distributed among some 45 hospitals throughout the country.

TIRE NOTES.

The failure of the Marshall Jacket Tyre Syndicate, Limited, with assets only sufficient to pay the debenture holders ten shillings on the pound, adds another to the somewhat lengthy list of tire flotations which have grievously disappointed investors in them. The idea of a jacket which is to bear the rough work of the road and keep the real tire in good condition has many supporters, and another company has recently been formed to supply motorists with old covers to be wired on to protect their new tires. The Wood-Milne Co., Limited, is now quite busy with a new band tire, but this does not contain the steel wool which has been a component part of the tires they have been exploiting for some years. The idea of incorporating steel wool in the rubber comes from America and is the property of a company there. The sole British rights were obtained from the inventor by Mr. Roberts of the Wood-Milne Co., Limited, on the basis of a certain payment for each tire made.

It is interesting to note that a number of the tire repairers have been enlisted by the War Office, through the agency of Harvey Frost & Co., of London, and certified by them. The principal work of the men is in connection with the Mechanical Transport Department of the Army Service Corps, though some are engaged with other corps; the pay is 4s. or 5s. per day, all found. It is now announced that men who hold the H. F. mechanics vulcanizing certificate and are also competent drivers are required for enlistment in the military wing of the Royal Flying Corps.

A new British registration which calls for notice is the Firestone Tyre & Rubber Co., Limited, which has a capital of £10,000 in £20 shares, the first directors being H. Hughes, Marshall

Stevens and J. Jordan. The declared object is to carry on the business of manufacturers of and dealers in rubber tires and metal rims for vehicle wheels and rubber goods of all kinds.

The works of the Sirdar Rubber Co., Limited, situated at Bradford-on-Avon, were put up for auction sale by tender as a going concern in December. The company, which had gained considerable success with its Sirdar motor tire, had been for some time in the hands of a liquidator.

THE RUBBER HEEL TRADE.

Attention was drawn to the prevailing depression in this branch by the sale by auction of the effects of the Lancashire Rubber Works, Limited, of Manchester, on December 23. The factory, with unexpired lease, was first offered as a going concern, but as no bid was forthcoming the plant and stock were sold piecemeal, with the exception of the heavy machinery, which was stated to be the property of Messrs. Hampson Brothers, the rubber engineers. For some time the close competition among heel manufacturers has been a source of concern to individual firms and the practical closing of the Continental trade by the war has been a serious matter. Belgium, Austria and Italy have been good customers for cheap heels, and also Germany to some extent. There has been practically no import of these goods from the Continent, and manufacturers have not had much in the way of increased home markets to make up for the loss of foreign business. At the same time some firms announce satisfactory business in home circles, so it is not all gloom. What foreign competition there is comes from America, in the form of a heel described by business competitors as being of a good medium quality.

ELASTIC THREAD.

As so large a part of the English production of this article is usually sent to Germany, France and Scandinavia, it is not surprising that this department of the rubber trade has been severely hit by the war, though considerable compensation has come in the increased demand for surgical equipment, into some of which it enters. Since the introduction of the rubber-cored golf ball the thread manufacturers, though they have no monopoly of the business, have experienced increased demands. At the moment, however, the trade in golf ball elastic, like all rubber expressly intended for sporting and games, is very slack. The rubber thread used for golf balls is, of course, of the band form approximating to electrical tape, rather than the rectangular type used for weaving purposes. With regard to the manufacturers of the latter commodity, there has been no alteration in the number and identity of the few firms engaged, and with one alteration the following list of members of the Rubber Thread Manufacturers' Association of today is identical with that of 30 or 40 years ago. Wm. Warne & Co., Limited, Tottenham, generally supposed to be the largest producers; Charles Macintosh & Co., Limited; David Moseley & Sons, Limited; The New Liverpool Rubber Co., Limited, and W. & A. Bates, Limited. The main objective of the association, which is quite distinct from the India Rubber Manufacturers' Association, is to fix the selling price of the thread for certain periods.

SYNTHETIC RUBBER FIASCO.

The company known as Synthetic Products, Limited, which came out with a flourish in 1912, appears already to have reached its end. The concern was to devote its energies to the production of acetone and fusel oil with synthetic rubber as a sort of side line. As a commercial undertaking the company has been anything but a brilliant success, and now, with funds virtually exhausted, and the government in possession of their synthetic rubber factory, presumably for billeting troops, operations are to be suspended until the end of the war. The report states that in the spring of last year the company was approached by important Continental chemical groups for the formation of an International Synthetic Rubber Alliance and negotiations were still in progress when the

war broke out. It is also stated that "an application has been received from a wealthy manufacturing corporation in the United States, with the object of developing our processes there."

The position as outlined at the annual meeting of the company seems to be that the process does not admit of the production of acetone alone. The manufacture of one part of acetone involves the simultaneous production of two parts of butyl alcohol, one of the higher forms of fusel oil. For acetone there is a certain demand, but butyl alcohol is rather an unknown quantity; whilst it might be possible to sell 50 tons, it is highly problematical whether a market could be found for as much as 1,000 tons. The embarrassing presence of butyl alcohol in such large quantity, however, would not matter so much if only the synthetic rubber process were more advanced, for the former provides the raw material for the latter. The position is, therefore, that acetone cannot be produced without butyl alcohol and the butyl alcohol cannot be utilized because the synthetic rubber process is not sufficiently developed. Even if it were, nothing could be done at present, because the government is in possession of the factory containing the synthetic rubber plant. Something was said by one of the directors at the meeting about "training their special bacteria" to concentrate upon the production of acetone and to let butyl alcohol take care of itself, but whether more will be heard of this seems open to doubt. Shareholders appeared to be more concerned with the fact that some £40,000 has been expended on development and experimental work without any very tangible results. But perhaps the unkindest cut of all was for the board, which includes the name of Sir William Ramsay, to be informed by the government that "they were not a satisfactory body to deal with" in connection with the manufacture of acetone, because they are not the registered owners of the patents under which the company operates.

NON-INFLAMMABLE SOLVENTS.

Carbon tetrachloride was proposed a good many years ago as a solvent for making rubber solution which would not be looked at askance by carrying companies, because it is non-inflammable; and it has been regularly used to a limited extent. Probably its use is on the increase, to judge by recent enquiries in the trade for the sources of supply. Except the special property mentioned, it does not seem to have any advantage over benzol and coal tar naphtha, and its toxic properties form a danger which must be guarded against. Of recent years the position held by carbon tetrachloride has been challenged by various organic chlorine compounds, the suitability of which as solvents for rubber was demonstrated two or three years ago by a professor of chemistry at Berlin, who patented these applications in this respect. The principal drawback to their use has been inability to compete with naphtha as regards price. Quite recently, however, two or three of these bodies, namely, dichlor-ethylene, trichlor-ethylene and tetrachlor-ethane, have been prepared on a large scale by a chemical corporation in England and at a price which closely corresponds to that of benzol. I understand that these liquids are used as solvents for certain resinous bodies. I note in "Rogers' Industrial Organic Chemistry," published in 1912, a note to the effect that the use of the following non-flam solvents for rubber is protected by patent, viz., carbon-tetrachloride, dichlor-methane, trichlor-ethane and tetrachlor-ethane. In English patent No. 22,704, October 8, 1913, the use of trichlor-ethylene as a rubber solvent is protected, so it would seem that as the production of these various chlorine compounds is developed somebody patents their use with rubber. I have experimented with some of these bodies of rather formidable name and find that they are certainly good solvents, but I should think that

their vapors, though non-inflammable, would prove to be more trying to those inhaling them than in the case with benzol. Further information on this point is a matter of some technical importance.

In the meanwhile I may mention that at a recent inquest in London on a workman employed at the air craft factory, Hendon, the home office expert said that the man had been working with a very quick-drying varnish consisting partly of tetrachlor-ethane which had caused disease of the liver. This was the first case of the kind reported and it was stated that the management of the factory would take special precautions in the future.

With regard to the business done in non-flam solvent in the last few years a prominent use has been in the making up or repair outfits for cyclists, the rubber works buying the solvent from the rubber chemical dealers under the name of non-flam solvent and not under its specific chemical name. In most cases the solvent was carbon tetrachloride, the price being about double that of benzol.

THE PATENT LIST

The French patent No. 468,493 of W. E. Muntz is concerned with the idea of protecting the fabric of rubber-coated materials from the action of sulphurous and sulphuric acids produced by oxidation of the sulphur in the rubber. This is to be done by treating the fabric previously with a 3 per cent. solution of barium hydrate under reduced pressure, allowing it to drain and then immersing in a 3 per cent. solution of ammonium carbonate and allowing to dry at the ordinary temperature. Presumably by this procedure we get a finely divided precipitate of barium carbonate on the cloth, which, under the action of sulphuric acid, will form barium sulphate. Theoretically this seems all right, but the point arises whether any precaution of the sort is necessary. I don't remember having come across any cases where the acid produced from the sulphur in the rubber has rotted the fabric, though it is supposed to exert a baneful influence upon the rubber. In order to prevent this treatment an alkali solution is often applied to single texture goods, though more often in the case of cold cure than dry heat cured goods.

Patent No. 11,125, of 1914, granted to Arthur Nixon, of Manchester, relates to a specified mixing of approximate proportions of ingredients for making solid rubber tires. This seems somewhat of a new departure for a patent, as none of the ingredients are novel and it would be extremely difficult to say that similar formulas have not been used by others. It would seem to be a case where it would be very difficult to prove infringement and at the same time it puts the patented man in a position to block enterprise in the constant change which is taking place in factories with the object of improving or cheapening mixings. Of course the usual procedure in a rubber works is to evolve a satisfactory formula and to keep it as far as possible a secret. Unless a new process of manufacture is involved it has not been customary to seek patent protection. The present patent may or may not refer to an exceptionally good formula on this point but it is important to know that it is patentable seems to be a matter fraught with considerable importance to the trade generally, in view of possible developments.

Exhibitors have explored the floor installed in the Nigeria and British Guiana Courts in the Public Exhibition Galleries at the Royal Institute in London, and, of them, consisting of rubber and rubber goods, as well as of other materials, but it is not clear what are the reasons for finding a market in these countries. The new exhibitors of the Nigeria Court include rubber and oil-palm products, native leather and materials used in dyeing it, ground nuts, ostrich feathers, and Nigerian wild silk. The exhibitors of the British Guiana Court, the

additions include rubber, cane sugar, rum, rice, cocoa, coffee, starch, arrow root and an interesting assortment of native woods.

THE ENGLEBERT FACTORY NOT OPERATING.

Letters from Englebert Bros. & Co., of Liege, Belgium, written January 6 and 12, deny the rumor mentioned in our issue of December—page 120—to the effect that their factory was being operated in the manufacture of tires for the German army. They state that their plant has been closed since August 4. Upon the occupation of Liege by the Germans the manufactured stores of the Englebert company were requisitioned and sentries were placed on guard to prevent tires being brought out for other than German needs, but the factory has not been in operation, except for a very brief period, when 20 workmen were allowed to complete an order for joints, valves and other technical goods for certain of the Englebert customers. It is supposed that the rumor may have been caused by the fact that one of the furnaces in the plant has been kept running to heat the offices, where accountants are at work, and that smoke has been seen issuing from the chimney.

ITALY'S RUBBER COMMERCE.

The extent to which the movement of rubber in the world's markets has been affected by the war, is revealed in recent tables of imports and exports, published by the Department of Commerce and Labor of the United States. In the foreign trade of Italy, for instance, the falling off is startling. For six months ending July, 1914, Italy imported from the United Kingdom, manufacturers of rubber and elastic, valued at \$515,000; in July, 1914, goods of the same character to the value of \$68,000; in August of that year \$50,000, and in September \$8,000. From Germany, Italy's imports of manufactures of rubber and elastic were, for six months to July 31, 1914, \$2,210,000; July, 1914, \$223,000; August, 1914, \$110,000; September, 1914, \$21,000. From France, during the six months to July 31, Italy imported manufactures of rubber and elastic to the value of \$1,163,000. For July, 1914, these imports amounted to \$102,000, for August, 1914, they had declined to \$54,000, and in September, 1914, they amounted to \$18,000. The export returns show a similar state of affairs: For six months, April to September, 1913, Calcutta exported raw rubber to the value of \$15,943; for the same period in 1914 the value of the exports was \$4,573.

The exports of rubber from French West Africa to Italy, amounting in value in 1912 to \$8,346,380, dropped to \$2,942,822 in 1913. Nigeria showed a similar decline from \$608,227 worth of rubber in 1912 to \$437,826 in 1913. In other lines, both raw and partly manufactured goods, the falling off has been equally severe.

INTERNATIONAL CONGRESS OF CHEMISTRY AT PETROGRAD.

A list of members of the Bureau of the Sections and Sub-sections of the Ninth International Congress of Applied Chemistry, to be held at Petrograd, Russia, August 8-14 of the present year, is contained in the preliminary announcement of that meeting. Section V-b—India Rubber and Other Plastics—is in charge of the following officers: President, B. Bysoff, of the Russo-American India Rubber Co.; vice-president, L. Muschus; secretary, B. Tiedemann, of the Technical School of Chemistry of Petrograd. Communications concerning this Congress should be addressed to the honorary secretary, W. N. Ivanow, 8 Winter Palace Place, Petrograd.

Now that the rubber tires used by the London omnibuses, of which 75 per cent. were formerly made in Germany, must of necessity be made by British firms, it has been suggested that there is no reason why this trade should not be kept permanently at home.

GERMAN RESTRICTIONS ON SALE OF TIRES.

Sale or other disposition of every sort of tire fit for passenger and other vehicles, and for motorcycles, is prohibited in Germany, this prohibition including old tires and those containing flaws. Dealers are forbidden the distribution of such goods, and rubber factories the filling of orders, even those placed previous to the enactment of this rule. Permits are obtainable from the authorities for the distribution of repaired or imperfect tires incapable of repair by the makers, this only in cases where the maintenance of a public vehicle service, a commercial undertaking or a medical practice is involved and would be rendered impracticable without rubber tires. Applications for such permits must be made under local police certification to the department of inspection for military, air and power vehicles, and must indicate the nature of the vehicle, the number of such vehicles, tires and tubes in the possession of the applicant, the number of tires requiring to be changed, etc., and in some localities the vehicle to be re-tired must be submitted to the bureau of inspection or to the military authorities.

RUBBER DISHES FOR GERMAN SOLDIERS.

Another rubber article has been added to the list already taxing the restricted supply of rubber in Germany. It is a rubber wash-basin, which is being manufactured in large quantities and finds its way to the front in the form of gifts from relatives.

This new type of wash-basin, folding into small space and adding little weight to the soldier's outfit, has been found exceedingly practical. It has proved such a success that the manufacture of plates, cups and saucers made of rubber-lined cloth is being considered, because of the saving in weight. At first it was objected that food served in such dishes would taste of rubber, but experiments proved that this could be avoided. A more serious problem, however, is the durability of such dishes, for they show a tendency to peel and crack; but this difficulty can probably be overcome.

According to an announcement in the "Frankfurter Zeitung" of November 23, German manufacturers of waterproofs have notified their customers of a rise in price of 20 per cent. in the case of rubber coats and 10 per cent. for coats of waterproofed material.

COTTON IN DEMAND.

Cotton in Germany is quoted at a price a little over 20 cents a pound, and it is reported that 2,000,000 bales will be required in that country in 1915. The American ambassador in Berlin says the question is not how much does Germany want, but how much can the United States engage to supply. Austria wants 800,000 bales; Italy, for which formerly 700,000 bales have sufficed, is now prepared to take 1,000,000 bales. As cotton is not contraband, and Great Britain, France, Germany and Austro-Hungary have given formal assurance that it will be so regarded, the principal thing is to secure a sufficient number of neutral vessels to transport it.

By order of the Imperial Chancellor of Germany the export or re-export of cables of all kinds has been forbidden from December 18.

During the fighting at Stenbach, Alsace, the rubber goods plant of J. Rollin was totally destroyed.

German chemists have been stimulated by the shortage of rubber, due to the war, to devote special attention to the production of a synthetic substitute for the natural article. The manufacture of reclaimed rubber has attained a high degree of perfection in Germany and every available scrap of rubber is turned to practical account.

RUBBER NOTES FROM CHINA AND JAPAN.

By Our Regular Correspondent.

THE state of war in Europe, but more particularly the embargo laid by Great Britain on the exportation of india rubber from her colonies in the Malay Peninsula, has seriously affected the rubber industry in China and Japan.

CHINA'S IMPORTS OF RUBBER

According to the latest available statistics, China's imports of crude rubber and manufactures of rubber were as follows:

CRUDE RUBBER AND GUTTA PERCHA

From.	1911.		1912.	
	Pounds.	Value.	Pounds.	Value.
Hong Kong	2,400	\$1,048.58	2,400	\$1,015.28
Singapore, Straits, etc.....	.....	.....	133	104.34
Great Britain	16,533	6,400.26	5,600	1,998.74
Germany	13,600	3,952.34	8,600	2,306.58
Belgium	1,333	187.96	.....	.....
France	666	229.40	.....	.....
Austria-Hungary	1,866	627.52	.....	.....
Japan	3,733	1,542.90	19,191	6,671.84
United States	4,392	1,053.76	.....	.....

Gross imports from foreign countries	44,523	\$15,042.72	35,990	\$12,096.78
Re-exported .....	.....	.....	133	44.40
Net imports	44,523	\$15,042.72	35,857	\$12,052.38

MANUFACTURED RUBBER (INCLUDING BOOTS AND SHOES).

From.	1911.		1912.	
	Pounds.	Value.	Pounds.	Value.
Hong Kong	\$24,897.30	.....	\$13,489.46
Macao	1,309.06	.....	701.52
Singapore, Straits, etc.....	313.76	.....	90.28
British India	241.24	.....	.....
Great Britain	56,592.24	.....	13,634.50
Germany	23,473.54	.....	14,015.60
Netherlands	1,537.72	.....	19.98
Belgium	309.32	.....	3,941.24
France	16,523.46	.....	9,735.44
Italy	102.86	.....	37.74
Austria-Hungary	3,026.60	.....	930.92
Russia and Siberia—by land frontier.....	32,473.42	.....	69,164.84
Russia and Siberia—by Pacific ports.....	36,163.06	.....	18,366.88
Korea	55.50	.....	7.32
Japan	58,403.76	.....	17,675.64
Canada	11.84	.....	.....
United States	8,808.96	.....	6,052.46

Total imports from foreign countries.....	\$264,243.64	\$167,863.82
Re-exported	14,806.22	9,123.46
Net imports	\$249,437.42	\$158,740.36

In connection with the falling off in 1912 it may be noted that during that year, the civil war, attendant on the establishment of the Chinese republic, affected commerce and industries of the country and the year's imports decreased in consequence.

DEMAND FOR RUBBER GOODS IN SHANGHAI.

Imports of rubber goods at Shanghai for 1913 were reported by the Japanese consulate as follows:

From.	Value.
Japan	\$2,618.86
Germany	8,269.50
Austria-Hungary	451.40
Great Britain	14,307.90
France	47.36
Russia	23.68
Belgium	61.42
United States	12,022.04
Total	\$37,802.16

Regarding the jinrikisha and the rubber tire trade in China, referred to in previous correspondence, I may supplement the following:

There is a present demand for pneumatic tires for the foboche not only in Shanghai, but in Sotow, Nanking and Tinja, where, following the example set by Shanghai, the old style iron tires on jinrikishas are being replaced with rubber pneumatics. The annual demand for rubber tires and tubes for foboche and jinrikishas should surely reach \$600,000 in the near future.

The future demand being so promising, the question is how the trade in pneumatic tires, with the merchant or consumer, can be established. Being on the ground, the Dunlop Rubber Co. (Far East), Limited, and the Michelin Rubber Co., Limited, hold a good position, have a goodly number of customers and will make every effort to develop their trade. It should, however, not be difficult to introduce new lines, under better conditions as to prices and terms, especially in regard to the durability and guarantee.

Suitable conditions would be the following:

Quality.—The quality must be insured by an eight or ten months' guarantee of durability, tires being stamped or numbered to facilitate guarantee records.

Price.—A fair price for a rubber pneumatic tire (2 x 36) would be 11 H. K. taels (\$8.14) per pair, f. o. b. Shanghai; for tubes, 4 to 4½ taels (\$2.96 to \$3.33), f. o. b. Shanghai. Should a rubber tire guaranteed for eight months fail or become useless in the sixth month, the dealer shall refund one-fourth of the full price, or exchange the damaged tires for a new pair on payment of one-fourth of the original price. On failure of the tire during any other part of the guaranteed term, the dealer to estimate the allowance according to the above proportion.

The import tariff on rubber tires is 5 per cent. ad valorem.

THE CRUDE RUBBER MARKET IN JAPAN.

The sudden cessation of crude rubber shipments from Singapore and British India on October 21, 1914, as a result of the embargo laid on these exports by the British government, resulted in a rise of about 75 per cent. in the price of crude rubber in Japan, compared with the July quotation, and a gradual slight increase in old rubber prices. The embargo imposes great hardships on the Japanese rubber industry and if continued for another month will result in the closing of some establishments, the smaller concerns carrying but small stocks of raw material. As a rule they use plantation rubber, which is cheaper than other grades.

As a result of representations made by Singapore to the Colonial Office in London, the embargo was removed on shipments of gutta-percha and jelutong to Japan. An appeal was made directly to the Colonial Office in London, and the Dunlop Rubber Co. (Far East), Limited, were allowed to export 50 tons monthly from Singapore and Colombo to Kobe, Japan, where their branch works are located. As a result of the efforts of Viscount Inoue, Japanese ambassador to Great Britain, the exportation from Singapore of crude rubber produced on plantations owned by Japanese was allowed, but the quantity is small and does not go far to meet the demands of Japanese manufacturers.

The Japanese consul at Batavia informed the Japanese government on November 28 that shipments of crude rubber were being made from there to the United States and that Japan could buy in that market. Nevertheless, the price of crude rubber in Japan remains high, and manufacturers being short of stock, prices are raised to consumers and are now sometimes twice the July quotations, or even more, so that it is difficult to frame a list of the domestic prices of crude rubber. According to a despatch from the consul of Japan at Colombo, Ceylon, the government of Ceylon held out hopes of a removal of the embargo as far as Ceylon is concerned, if he was informed of the names and output of the Japanese manufacturers interested. This would result

in a material reduction in prices in Japan, but they will not reach a normal level until the embargo on exports from Singapore and Ceylon is removed.

Crude rubber imports, from August to November, 1913 and 1914, were as follows:

	1914.		1913.	
	Pounds.	Value.	Pounds.	Value.
August	109,480	\$52,605	158,877	\$113,849
September	261,476	110,301	200,881	112,791
October	322,318	129,660	254,946	134,544
November	Not known	47,272	229,569	104,570
.....		\$339,838	844,273	\$465,754

Quantities and values from January 1 to October 31, 1913 and 1914:

	1914.		1913.	
Source.	Pounds.	Value.	Pounds.	Value.
British India	343,264	\$190,013	263,758	\$192,806
Straits Settlements...	1,480,686	621,181	1,312,517	750,439
Dutch Indies	8,554	1,446	13,928	8,908
Great Britain	202,314	144,288	405,818	380,595
United States	11,054	7,509	138,932	99,551
Other countries	2,582	1,796	84,484	79,685
	2,048,454	\$966,233	2,219,437	\$1,511,984

In explanation of the above statistics it may be stated that the imports for October, 1914, were very large, foreign bills of exchange were beginning to draw and large orders for crude rubber were given. The imports for August and September were in most part from ships that had taken refuge in neutral ports from German cruisers. The imports for November, 1914, show a heavy falling off, the embargo on exports from British colonies having just come into force.

JAPANESE EMBARGO ON ACETIC ACID.

Since the commencement of the war, the Japanese government has placed an embargo on exports of various drugs, medical and chemical supplies, etc.; among the rest, on acetic acid, which planters in the Far East use to coagulate latex. With Germany and Japan, two of the chief sources of the acid, out of the market, planters will have to find some more readily obtainable coagulant, or one of home manufacture. The subject is already receiving considerable attention in Ceylon and other rubber planting centers.

RUBBER GOODS IN SIAM.

Rubber goods imports into Siam for the fiscal year ending March 31, 1914, totaled 159,115 pounds, valued at \$119,507.

The imports consisted of 43,115 pounds of motor-car tires, value \$48,073; 10,816 pounds of cycle tires, value \$12,926; 38,691 pounds of carriage and jinrikisha tires, value \$18,988, and 66,506 pounds of other rubber goods manufactures, value \$39,520.

Of the total rubber goods imports for the fiscal year 1913-14, the United Kingdom and dependencies furnished \$105,193 worth; Germany, \$12,492; France, \$198; Japan, \$468; United States, \$741; all other countries, \$415 worth.

The United States, although furnishing only a small share of the rubber goods imports, during last year supplied 76 motor cars to Siam, against 114 cars from all other countries, so it is expected that in the import of automobile tires, at least, a decided advance will be made during the current year.

The import duty on rubber goods is 3 per cent. ad valorem.

Robert Sandison, at one time on the staff of the English branch of the Continental Tyre Co., has taken over the management of the Columb Tyre Co. (Far East). He is a director of the Columb company in Java, which has the selling rights of Prowodnik tires in the Dutch East Indies, and also has charge of Prowodnik distribution in China and Japan.

Some Rubber Planting Notes.

F. M. S. DECEMBER EXPORTS ESTABLISH A NEW RECORD.

ACCORDING to information cabled by the Government to the Malay States Information Agency, the exports of plantation rubber from the Federated Malay States for the month of December amounted to 3,361 tons, as compared with 2,889 tons in November, and 2,616 tons in the corresponding month of 1913.

Appended are the comparative statistics for 1912, 1913 and 1914:

	1912.	1913.	1914.
January.....tons	1,218	2,131	2,542
February	1,212	1,757	2,304
March	1,379	1,737	2,418
April	1,020	1,626	2,151
May	1,007	1,225	2,069
June	1,029	2,005	2,306
July	1,204	1,781	2,971
August	1,633	2,363	1,850
September	1,326	2,000	2,879
October	1,435	2,160	2,897
November	1,394	2,062	2,889
December	1,649	2,616	3,361
Total	15,506	23,463	30,697

It will be seen that the figures for December establish a new record for one month's export, while the total for the year, the biggest yet recorded by the Federated Malay States, shows an increase of 7,234 tons over last year's record. It is interesting, for the sake of comparison, to give the aggregate export of plantation rubber from the Malay States for the past six years: 1909, 2,641 tons; 1910, 5,452 tons; 1911, 8,792 tons; 1912, 15,506 tons; 1913, 23,463 tons; 1914, 30,697 tons.

WHY PUBLIC SALES?

The alleged benefits of public rubber sales have lately been discussed in the columns of "Tropical Life." It is remarked that "public sales are still withheld, but there is no reason why any should take place. What sells, sells easily, and those qualities which do not attract the large buyers are not likely to do any better if dragged before the limelight of the public sales."

Planters are urged to send to the market what buyers want and not merely what they are able to turn out. Standard qualities of a good and reliable character are wanted, but they must be such as to command a ready sale at a good profit. Public sales are time-honored institutions, but there are other methods of selling—notably the inscription system.

BURMA PLANTERS SEEK GOVERNMENT ASSISTANCE.

A recent issue of the "Malay Mail" reported an appeal on the part of the Lower Burma Planters' Association to the lieutenant-governor, in which the local government is requested to afford temporary financial assistance to planters in that section. The absence of foreign shipments of rubber since the war began, the small local demand in the Eastern markets of Singapore and Colombo and the difficulty in obtaining loans from local or home banks, together with the fact that in many instances loans have been called, has resulted in serious difficulties for the planters. Unless some such step is taken a point must soon be reached at which coolies will have to be discharged and cultivation suspended, and such a shutting down would entail the disorganization of the official staff and scattering of the labor force. It is suggested that the government advance or guarantee a monthly payment, the amount to be determined, after enquiry by the deputy commissioner or other government official.

RUBBER EXPORTS OF SEYCHELLES ISLANDS.

According to a British return, the following have been the shipments of Seychelles rubber, all of which has gone to the United Kingdom: 1912, 677 pounds, value \$750; 1913, 1,768 pounds, value \$1,390.

NEW RUBBER MARKET AT BATAVIA

The Consul General of the Netherlands at New York, A Van de Sande Bakhuyzen, advises us, under date January 19, of the receipt of information by cable from the Chamber of Commerce at Batavia that a rubber market will be established in Batavia, Netherland East Indies.

STATISTICS OF NETHERLAND INDIES.

Official statistics show that in June, 1914, there were in the Netherland Indies 555 separate rubber undertakings, as compared with 548 in June, 1913. Of these undertakings 332 at the earlier date were in Java, 216 in other possessions; at the later date 344 in Java and 211 in other possessions.

The planted area had increased from 442,192 acres in 1913 to 511,682 in 1914, although in Java there was a slight restriction from 217,692 to 213,507 acres.

About 90 per cent. of the total planted area was under *Hevea*, the remainder under *Ficus*. Rubber alone was planted in about half of the acreage, while the remainder was in mixed cultures.

RAIN IN JAVA.

Considerable anxiety has been felt in Java by reason of the drought which has prevailed in that island since the middle of June. According to recent advices, the dry spell has ceased, much to the relief of those engaged in the local planting industry.

LATEX COAGULATION IN CEYLON.

The shortage of acetic acid, used as a coagulant for rubber latex in Ceylon, now that the supply from Germany is cut off, has led to various suggestions as to substitutes for the product. The manufacture of the acid locally, by the destructive distillation of woods, of which it is claimed that there is a good supply in Ceylon, is urged particularly, the residual product being a grade of charcoal that would find a ready market as fuel. Dry coconut shell can also be used for the same purpose, the dry distillation of 10 pounds of shell yielding about ½ pound of tar and 2½ to 3 pounds of crude pyroigneous acid, containing about 12 per cent. of acetic acid. *Withanica Coagulans*, a plant that grows wild in Ceylon, is also proposed as a coagulant for rubber.

Experiments have also been conducted in the coagulation of latex by means of toddy vinegar, but the most promising results are claimed for the fluid obtained from fresh coconuts, when broken for copra. This fluid, left to ferment for a few days, becomes sufficiently acid to effect the desired coagulation and the process is claimed to furnish a better product than acetic acid. Experiments are being made with other coagulants some of which are impracticable, while others promise to furnish a utilizable substitute for acetic acid. Sulphuric acid in dilution is also suggested as a coagulant, and the "Planters' Chronicle," Bangalore, discusses at length its use for this purpose.

One process of coagulation consists in exposing the latex in shallow trays to the smoke in smoke houses, a thin layer being added each day to that already coagulated, until in a week or two a fairly thick slab is produced. Layers of latex two inches in depth are found to coagulate completely within 24 hours.

The Indian Commercial Intelligence Department is making preparations to assist Indian manufacturers in the production of goods hitherto imported from Germany and Austria. For this purpose, suitable leaflets will be circulated among Indian manufacturers, describing these articles and showing the value of the trade they represent. Exhibitions, showing samples of the imported goods and of similar articles made in India, are to be opened in Bombay, Madras and Calcutta.

PLANTING NOTES.

The rubber planting companies in the Far East report a heavy depletion of their home official forces as a result of the war. A large percentage of the staff of the leading companies is either on active service at the front or otherwise engaged in affairs connected with the war. Some of the offices of the leading estates have been thus almost completely demoralized.

The directors of the Straits Plantations, Limited, in their fifteenth annual report submitted at their recent meeting, gave the crop of rubber for the year 1913-14 as 50,485 pounds, compared with 49,129 pounds for the preceding year. The cost was 1s. 7.71d. per pound, f. o. b. Teluk Anson, against 1s. 8.12d. per pound the previous year, and the average net price realized was 1s. 10.37d. For the year 1914-15 a crop of 43,000 pounds is estimated.

At the fifth ordinary general meeting of the Good Hope (Selangor) Rubber Co., a proposition was submitted to convert the corporation into a London sterling company. A favorable report on the condition of the company's properties was made by Mr. Kelway Bamber, who had recently returned from a visit to the estates, and the report and accounts were adopted as presented.

The Seaport Estate, according to a report presented by its directors at the recent annual meeting held in London, harvested last year a crop of 244,500 pounds of rubber, against 240,000 pounds, estimated, the previous year's yield having been 198,494 pounds. The total cost of production, including London expenses and all charges, was 1s. 5.12d. per pound, compared with 1s. 11.38d. per pound last year. The year's net profit amounted to £11,662 14s. 4d., to which must be added £6,873 14s. 10d. carried forward, making £18,536 9s. 2d., from which the payment of a dividend of 6 per cent. was recommended, leaving £7,286 9s. 2d. to carry to next year's account. For the year ending June 30, 1915, a rubber crop of 270,000 pounds is expected by the manager. Several additions were made to the buildings on the estate, including an assistants' bungalow, a smoke house, three sets of permanent coolie lines and an extension to the factory, in which a second engine and a washing mill were installed.

The Golden Hope Rubber Estate, Limited, announces the declaration of a 5 per cent. dividend on the paid-up capital.

At the eighth annual general meeting of the Sungkai-Chumur Estates, Limited, the chairman announced net profits of £18,004 which, with £6,391 brought forward from last year, gave them £24,396 to dispose of. From this it was proposed to pay a final dividend of 10 per cent., making with 2 interim dividends 30 per cent. for the year. After transferring £6,000 to development account, making a total of £10,496 for working capital, the sum of £5,396 would be left to carry forward. The total production for the year was 347,621 pounds, 3,621 pounds more than last year, at a cost of 1s. 3.71d., compared with 1s. 9.76d. for last year, a reduction of more than 6d. per pound. The gross average price realized was 2s. 3.25d., compared with 3s. 8.79d. the previous year. The average acreage tapped was 868 out of 1,469 planted, the yield per acre 388 pounds, against 340 pounds last year, and the yield per tree 3.20 pounds, compared with 2.72 pounds last year. For the current year a production of 350,000 pounds is estimated.

The proposed shipment of latex from the plantations in the Far East to London, for conversion into rubber, in connection with which English capitalists are rumored to have secured a patent, is the subject of comment in "Times of Ceylon," which claims to recognize in the proposition a move in the direction of standardization which would be promoted by the collection of large quantities of the material from various sources, for treatment in one large central plant. We still fail to comprehend what advantage would be gained by sending the latex to London, where it could be just as well treated in Ceylon, and the rubber would be a much safer and more convenient article to ship than the latex.

REVISED DUTY ON RUBBER EXPORTED FROM THE MALAY STATES.

FOR some time past the rubber growers of the Federated Malay States have been seriously dissatisfied with the effects on their business, especially on the profit side, of the export duty on rubber and the rentals paid on land occupied for plantation purposes.

As a result of correspondence and negotiations between the Council of the Rubber Growers' Association in London, the British Colonial office and the government of the Federated Malay States, the latter body, with the approval of the Secretary of State for the colonies, has sanctioned a revised scale of duty and certain modifications in rental.

The revised scale of duty, recommended by the High Commissioner for the Malay States as the result of a meeting held by him with the Acting Chief Secretary at Kuala Lumpur, at which the unofficial members of the Federal Council residing there and residents of Selangor and Negri Sembilan were present, is as follows:

No export duty shall be levied on rubber when the value of first grade plantation rubber in London is less than 1s. 6d. per pound; when the value is 1s. 6d., and not more than 2s., a sliding scale is provided for the regulation of the duty, and when the price rises to more than 2s., the duty is to be 2½ per cent., as at present; the duty is to be calculated on the value of first-grade rubber and no allowance is to be made for inferior grades.

As regards rentals, at the Estates' option, the enhancement of rent should be modified to be 50 cents from the seventh to the tenth year, inclusive; \$1 from the eleventh to the fifteenth year, \$2 from the sixteenth to the twentieth, and \$3 from the twenty-first year. These modifications are accompanied by a more stringent cultivation clause, calling for the cultivation of 5 per cent. of the area annually for 5 years, a further 25 per cent. from sixth to tenth year, inclusive, and from the eleventh to the fifteenth year an additional 25 per cent.

These recommendations having been approved by the British Colonial Secretary, the High Commissioner was so informed.

The Council of the Rubber Growers' Association does not consider the modification either satisfactory or final, and on the cessation of hostilities will again take up the question with the Colonial Secretary and the government of the Federated Malay States.

RUBBER IN ZANZIBAR AND PEMBA.

Zanzibar has an area of 400,000 acres, with a population of 114,000, and Pemba 245,000 acres, with about 85,000 inhabitants. There are two rubber-producing plants indigenous to Zanzibar, the *Landolphia Kirkii* and the *Muscarenhasia elastica*; the rubber exported being almost entirely obtained from the former. The exports of rubber from 1909 to 1913 were as follows: 1909, 2,740 pounds; 1910, 4,124 pounds; 1911, 4,285 pounds; 1912, 3,588 pounds; 1913, 2,220 pounds.

Ceara rubber trees were largely planted in 1907 in the north of Pemba, but owing to difficulties of labor and transportation their cultivation was discontinued.

INCREASED COCHIN CHINA YIELDS DURING DRY SEASON.

Reports from Cochin China state that the yield of rubber during the dry season, instead of being less than in the rainy period, as in many other countries, is as much as 50 per cent. greater. The Annamite laborers are remarkably dexterous, the average number of trees tapped daily being 600 for men and 450 for women. The method used gives a constant flow of latex, with a minimum amount of bark removed.

Should be on every rubber man's desk—Crude Rubber and Compounding Ingredients; Rubber Country of the Amazon; Rubber Trade Directory of the World.

NOTES FROM DUTCH GUIANA.

By Our Regular Correspondent.

THE revenue of the colony for the year 1914 was much less than that of the previous financial year. This falling off was due to a partial failure of the balata industry consequent upon the European war and a corresponding depression in trade generally. The year can hardly be recorded as having been a prosperous one. Apart from the war, from the effect of which the peasant proprietors and laboring classes suffered considerably, there was also a large increase in the price of imported foodstuffs from the United States, which advanced the cost of living. There does not appear to be much hope of these high prices abating, and the result will probably be, as far as this colony is concerned, that the consumption of many articles will gradually be discontinued in favor of local products, while the war lasts.

Thirty motor carts were imported during last year, twenty-five of which came from the United States, the trade with which country has in the past few years shown a steady increase.

Owners of rubber plantations have every reason to be satisfied with the results of the past year. The harvests of 1914 were exceedingly good. The prices were not as satisfactory as might have been expected, but the planters have not yet begun to produce rubber in sufficient quantities to have big turnovers. When the prices advance they will all come in for big profits, for then large quantities will be regularly shipped to Europe and the United States. We think the waiting game of the planters a very sensible one. The by-products, however, proved highly remunerative, and dealers, in common with producers, can look back upon a year of fair success in spite of the troubled state of affairs and the unstable markets. There is also every reason to believe that the present year will see a continuance of prosperity, and in increased magnitude. The weather experienced towards the end of last year was entirely favorable, and large crops may be expected as the result.

A fair amount of new land has been planted with rubber, cocoa and coffee during the past year, but there still remain unopened thousands of acres quite suited to rubber growing. It is also gratifying to note that up-to-date methods of cultivation are being more generally adopted.

With a view to bringing about a further improvement in the preparation and quality of plantation rubber, the Agricultural Department has issued a set of recommendations for the treatment of latex and the curing of rubber and its sorting, grading and packing. As regards the costs of production in the colony, the retrenchment enforced last year by the planters will compensate in the long run for the low prices of the products.

The balata industry is practically ruined because of the European war, and will continue to go from bad to worse unless the government adopts measures to afford the companies temporary aid. The financiers in Holland—or those directly interested in the Surinam balata industry—have not the money to make the necessary disbursements in the colony. Thousands of kilos. of balata are tied up in the colony, which under ordinary circumstances, would mean enormous amounts of ready cash in circulation. These facts are responsible in a great measure for all the misery experienced by the greater part of the population, who derive their living, directly or indirectly, from the balata industry.

It was in 1880 that Dutch Guiana entered the world's markets as a balata producer. She now supplies about one-quarter of the world's balata. Her largest exports were in 1913, with 1,155,540 kilograms (2,547,503 pounds), and she would have beaten all records last year but for the European war. The government—by order of the Ministers in Holland

has declined all applications for balata concessions, pending further communications from the Hague. Several persons are desirous of prospecting new tracts, for exploitation when the crisis is over, but no prospecting licenses will be granted.

It is encouraging, however, to note that the Governor is devoting serious attention to the economic condition of the colony in the present crisis. He has requested the Chamber of Commerce and the Labor Bureau to inquire into prevailing conditions and to forward a joint report to the government.

NOTES FROM BRITISH GUIANA.

By Our Regular Correspondent.

IN previous letters mention has been made of the anxiety felt here because of the gloomy prospects of the balata industry as a consequence of the war. Most local industries—sugar in particular—have benefited rather than otherwise as a result of the war, but the balata industry has been hedged round with many difficulties. The system under which this industry is conducted, by which the companies are called upon to send large stocks of provisions to their depots in order to provide the laborers with the necessities of life, threatened at one time to create a serious difficulty. In this colony, as elsewhere, prices rose suddenly after the outbreak of war, and the prospect of increased cost of production immediately presented itself. This danger was averted by the government, which appointed a committee to fix maximum prices for foodstuffs. But an even greater danger arose, a permanent solution of which has not yet been arrived at, although a temporary way out of the difficulty has been found.

The greater part of this colony's balata, as indeed of the world's production, has in the past found its market in Germany, and for the present that market is definitely closed to the British producer, however, the neutral producer may be able to make use of it. The largest producer of balata in this colony is the Consolidated Rubber & Balata Estates, Limited, and this company is in the unhappy position of having produced a record crop this year at a low cost, which it is unable to dispose of except at a sacrifice, perhaps even below the cost of production. Consequently recourse has been had to government assistance. The legislature has authorized the government to guarantee an advance of \$75,000 to be made by the Royal Bank of Canada to the local managers of the company, on a security of one pound of balata for every 15 cents advanced. The resolution embodying this policy met with some opposition, but was passed without a division.

The exact position of the company and, inferentially, of the balata industry, cannot be better explained than by quoting the governor's minute addressed to the Combined Court, which was as follows: "It is well known to the members of the court that the Consolidated Balata Co. controls very nearly the whole of the balata production and export in British Guiana. The company is in difficulties owing to the present condition of the balata market, caused by the war preventing the sale of large quantities of balata at a remunerative price. The company now has 667,000 pounds of balata, over which the Royal Bank of Canada has a lien on account of moneys advanced to the company. In addition the company has at New Amsterdam, at Potaro Mouth, in the Pomeroon, and on the way to these stations and to Georgetown, balata to the amount of 425,000 pounds. This latter balata is at present free from lien. Your approval is asked for the government to guarantee a further advance by the Royal Bank of Canada to the company to the amount of \$75,000, on the basis of the attached document. It is con-

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Recent Patents Reading is Pleased

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Single copies, 15 cents.
Entered as Second-Class Matter, May 1, 1947,
Post Office at New York, N. Y., under
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- 1,122,489. Tire preserving suit. R. Zaczek, assignor of one-half to J. Meeker, both of Chicago, Ill.
- 1,122,465. Vulcanizer press. P. Bock, Schöckel, near Berlin, Germany.
- 1,122,540. Spring tire for motor vehicle. F. E. Rouse, London, England.
- 1,122,555. Cusson tire. S. G. Swenson, Emporia, Kans.
- 1,122,574. Packing cup for pumps. H. Z. Cobb, Winchester, Mass., assignor to Revco Rubber Co., Portland, R. I.
- 1,122,653. Dyeing of rubber and rubber products. D. Spence, Akron, Ohio, assignor to L. B. F. Goodrich Co., New York, N. Y.
- 1,122,695. Vulcanizing apparatus. J. F. Crowley, assignor to The Beacon Falls Rubber Shoe Co., both of Beacon Falls, Conn.
- 1,122,712. Detachable shoe for tires. J. C. Tucker, Steubenville, Ohio.
- 1,122,813. Method of making tire beads. W. C. Stevens, assignor to The Firestone Tire & Rubber Co., both of Akron, Ohio.
- 1,122,824. Art of treating rubber. L. C. Warner, Naugatuck, assignor to The Beacon Falls Rubber Shoe Co., both of Beacon Falls in Connecticut.
- 1,122,875. Fire. C. B. Doty and G. S. Doty, both of Philadelphia, Pa.
- 1,122,886. Vacuum massaging device. T. H. Ellis, assignor of one-fourth to J. U. Mentee, one-fourth to S. R. Tyler, and one-fourth to D. A. Ruebel, all of St. Louis, Mo.
- 1,122,988. Catamenial appliance. J. C. Myers, Palestine, Texas.
- 1,123,034. Pneumatic tire. S. J. Sydney, Philadelphia, Pa., assignor of one-half to D. W. Alexander, Toronto, Ont., Canada.
- 1,123,058. Life preserver of waterproof material. O. A. Youngren, Sheridan, Wyo.
- 1,123,159. Syringe. W. E. Allen, San Diego, Cal.
- 1,123,180. Recoil pad for gun stocks. J. S. Day, New Orleans, La.
- 1,123,194. Life preserver. W. H. Kamen, assignor of one-half to M. L. McKean, both of Oakland, Cal.

Trade Marks.

- 73,175. Overman Tire Co., New York, N. Y. Illustration of a tire with a red circumferential stripe. For elastic vehicle tires.
- 76,071. Continental Rubber Works Co., Erie, Pa. The word *Vitana*. For rubber goods, rubber belting, tubing, etc.
- 80,630. The Savage Tire Co., San Diego, Cal. The words *Red Grante* on a rectangular background in label style. For inner tubes or air tubes for vehicle tires.
- 82,224. Cohen, Goldman & Co., New York, N. Y. The word *Knit-tex*. For raincoats.
- 82,311. The Sterling Gum Co., Inc., New York, N. Y. The word *Cammo*. For chewing gum.

[NOTE. Printed copies of specifications of United States patents may be obtained from THE INDIA RUBBER WORLD office at 10 cents each, postpaid.]

GREAT BRITAIN AND IRELAND.

PATENT SPECIFICATIONS PUBLISHED.

The number given is that assigned to the Patent at the filing of the application, which in the case of these listed below was in 1913.

Describes Patents for Invention.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, DECEMBER 2, 1914.]

- 17,748 (1913). Hose pipe. E. Reddaway, Cheltenham street, Pendleton, Manchester.
- 17,752 (1913). Soft velum hat made with a layer of rubber. C. Clement, 66, Hyde Road, Denton, near Manchester.
- 17,802 (1913). Rubber in bats, clubs, etc. J. S. Hollbrook, 109, Deansgate, and E. S. Farrell, of Macintosh & Co., Cambridge street, both in Manchester.
- 17,880 (1913). Process of extracting india rubber. F. Kempter, Germany.
- 17,881 (1913). Spring wheels with rubber covered wood block tread. L. de M. Marques, Botanical Gardens, Rio de Janeiro, Brazil.
- 17,960 (1913). Spring wheel having transverse hollow rubber cylinders arranged between radial plates. G. G. Le Meneust, 133, Grande Rue, Boulogne-sur-Seine (Seine), France.
- 17,986 (1913). Rubber washer for feeding bottles. E. Shermann, 2, Hauffstrasse, Ehrenfeld, Köln, Germany.
- 18,007 (1913). A tire core consisting of alternate layers of rubber and windings of fabric. A. Witzel, 45, Wilhelmstrasse, Ludwigshurg, and A. Federer, 19, Buchenstrasse, Stuttgart, both in Germany.
- 18,054 (1913). Elastic band for bottle stoppers. E. Hales, Station Road, Hooton, Cheshire, and Spring Packing Case Co., Spring Works, George street, West Bromwich.
- 18,060 (1913). Treating rubber. F. A. Byrne, Ludgate Hill, Brompton, London.
- 18,061 (1913). Treating rubber. F. A. Byrne, Ludgate Hill, Brompton, London.
- 18,062 (1913). Treating rubber. F. A. Byrne, Ludgate Hill, Brompton, London.
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- 18,199 (1913). Treating rubber. F. A. Byrne, Ludgate Hill, Brompton, London.
- 18,200 (1913). Treating rubber. F. A. Byrne, Ludgate Hill, Brompton, London.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, DECEMBER 9, 1914.]

- 18,133 (1913). Wheel tire. C. A. Spittell, 55 Broad street, Newark, N. J., U. S. A.

- 18,180 (1913). Pneumatic tire. R. Dale, 14, Dovedale Road, Millhouses, Sheffield, and S. E. Heaton, "Lyndhurst," Moorgate Grove, Rotherham.
- 18,184 (1913). Catamenial appliance. R. E. Wright, 62, Basinghall street, London.
- 18,346 (1913). Wheel tire. W. T. Dorgan, Parkwood avenue, Akron, Ohio, U. S. A.
- 18,434 (1913). Solid rubber tires. F. Cremer, 6, von Schildeckstrasse, Fulda, Germany.
- 18,507 (1913). Catamenial appliance. E. Schultz, 28 Woodland Villas, Muswell Hill Road, Muswell Hill, London.
- [ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, DECEMBER 16, 1914.]
- 18,714 (1913). Hollow, resilient, detachable seat rim. L. Pollak, 48, Grosslingasse, Pozsony, Hungary.
- 18,724 (1913). Medical syringe. O. James, 444 Center street, Fall River, Mass., U. S. A.
- 18,755 (1913). Electric insulator with rubber washer. A. Orinschnig, 14, Via Epulo, Pola, Austria.
- 18,759 (1913). Pontianak boot filling composition. F. E. Woodward, Lachine P 2, Montreal, Que., Canada.
- 18,792 (1913). Mud guard comprising ring of india rubber. F. G. Haworth, Vale House, and R. Illingworth, 11, Snape street, both in Darwen, Lancashire.
- 18,815 (1913). Process of manufacture of wheel tires and like rubber articles. C. H. Gray, of India Rubber, Gutta Percha and Telegraph Works Co., Silvertown, Essex.
- 18,816 (1913). Game comprising rubber covered rings. W. Margot, 57, New Compton street, Shaftesbury avenue, London.
- 18,831 (1913). Wheel tire of rubber and steel. G. Sarlabous, Saint Matory, Haute Garonne, France.
- 18,905 (1913). Brace or suspender. R. C. Wadsley, Dealtry Road, Putney, London.
- 18,917 (1913). Surgical truss with pneumatic pads. E. S. Devroyé, Ancha, Barcelona, Spain.
- 19,057 (1913). Shock absorber in which rubber blocks are interposed between a set of radial ribs. J. L. Norton, Sampson Road North, Birmingham.
- 19,067 (1913). Circumcision appliance of rubber. T. F. Keenan, 58, Upper Clapton Road, and B. Morris, 170, Commercial Road—both in London.
- 19,118 (1913). Wheel tire. T. Sloper, Southgate Villa, Devizes, Wiltshire.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, DECEMBER 23, 1914.]

- 19,114 (1913). Pneumatic tire. E. J. Audrieu, 515, Rue Lannois, Roubaix, France.
- 19,260 (1913). Atomizer. G. J. Kelley, 178 North Main street, Attleboro, Mass., U. S. A.
- 19,270 (1913). Rubber sleeve in vibration damping supports for delicate instruments. E. F. C. Seignol, 24, Rue Langier, Paris.
- 19,352 (1913). Waist belt for garments, made of uncovered rubber. S. H. Thorp, Charters Towers, Queensland, Australia.
- 19,418 (1913). Block tire. H. P. Haas, 112, Boulevard de la Seine, Brussels.
- 19,425 (1913). Horseshoe with rubber pad. J. Opladen, 28, Schaafenstrasse, Cologne, Germany.
- 19,462 (1913). Pneumatic wheel tire. J. Wallace, 35, Darwen street, Blackburn.
- 19,464 (1913). The inflating valve consisting in part of a rubber cone. F. A. Poupard, 4, Chestnut Road, W. Norwood, London.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, DECEMBER 31, 1914.]

- 19,869 (1913). Finger stall or bandage of rubber. H. R. Jackson, 11, Ingelow Road, Battersea, London.
- 19,940 (1913). Tire of rubber with soft rubber core. W. H. Carmont, 74, Eden street, Kingston, Surrey.
- 19,950 (1913). Leather faced rubber driving belt for motorcycles, etc. Dunlop Rubber Co. and C. Macbeth, Manor Mills, Salford street, Aston, Birmingham.
- 19,994 (1913). Toy pistol with elastic strip controlling release of projectile. G. C. Lasares, 319 State street, Boston, Mass., U. S. A.
- 20,035 (1913). Rubber and canvas gaiter for insertion between the air tube and cover of a tire. S. C. Caddy, Kildare, Keynsham, near Bristol.
- 20,185 (1913). An tube for wheel tires. Motorists' Purchasing Association and C. C. MacDowell, 170, Piccadilly, London.

THE FRENCH REPUBLIC.

PATENTS ISSUED (with Dates of Application).

- 472,507 (May 16, 1914). Protective nail pulker. J. Simonet.
- 472,509 (May 18). Wheel tire. J. Leoviguit.
- 472,548 (May 22). Elastic automobile tire. E. E. Rousse.
- 472,595 (May 22). Elastic wheel tire. B. Buscaglia.
- 472,712 (August 13, 1913). Improvements in hernial bandages of rubber. F. Canvin.
- 472,735 (May 27, 1914). Small elastic heel for footwear. J. Brouillard.
- 472,753 (May 28). Substance replacing rubber or leather and its process of manufacture. E. B. Cook.
- 472,789 (August 18, 1913). Soft or hard plastic substance. F. E. Falvet.
- 472,846 (May 30, 1914). Improvements in covers of pneumatic tires. J. D. Tew.
- 472,852 (May 30). Substance analogous to leather, suitable for molding and hardening. R. Miller.
- 472,869 (August 22, 1913). Improved dress shields. H. Bloch and V. Gelas.

- 47,885 (June 2, 1914). Shaping apparatus for tire carcasses. E. C. Morton.
 47,934 (May 6). Process of preparation for rendering pneumatic tires watertight. H. Lewison.
 47,936 (May 6). Tire composed of small blades close to each other. E. Spiegel.
 473,003 (August 22, 1913). Protected air chamber. P. Labadie.
 473,006 (June 3, 1914). Tire for automobile wheels with antiskid grooves. E. Krest.

[Note: Printed copies of specification of French patents can be obtained from R. Bobet, Ingenieur-Consult, 16 Avenue de Villiers, Paris, at 50 cents each, postpaid.]

THE GERMAN EMPIRE.

PATENTS ISSUED (with Dates of Validity.)

- 281,262, Class 39b (December 23, 1910). Process for production of plastic or elastic masses. Julius Stockhausen, Crefeld.
 281,268, Class 39b (December 21, 1911). Process for production of plastic or elastic masses from glycerine gelatine, etc. Julius Stockhausen, Crefeld.
 281,202, Class 55d (December 9, 1913). Pressing roller for paper machine with a rubber jacket under the influence of an air hose fastened to the core of the roller. Richard Schultz, Diefenbachstr., 57, Berlin.
 281,376, Class 71a (January 25, 1913). Extensible heel with horseshoe shaped rubber edge. Paul Pieper, Herderstrasse, 79, Dusseldorf.
 281,431, Class 77a (August 14, 1913). Closing of needle stitching on rubber playing balls. Gummiwaren-fabrik M. Steinberg, Kohn-Linden-thal.

THE COLONIAL TIRE & RUBBER CO., LIMITED.

The above is the title under which the firm hitherto known as Harry R. Sayer, Limited, will hereafter do business, the name of the concern having been changed on January 21. This company deals in rubber goods of all kinds—tires, clothing, footwear, drug sundries, hose, belting, packing, etc.—with headquarters at Vancouver, and a branch at Victoria, British Columbia.

RUBBER PLANTATIONS NEAR HOME.

A CORRESPONDENT suggests the following: "One lesson of the war that is being thoroughly impressed on the rubber trade is the necessity of having our rubber supply near at home and under our own control. England dominates the rubber plantations in the Far East, which are intended to supply the world with rubber. There is no doubt about the supply, but the great distance, militant Europe and Asia and the embargo are very apparent obstacles. What avails a producing plantation owned by Americans in Ceylon or the Malay States when in times of war the embargo and contraband list prohibit shipping, even under the American flag?"

The cultivated *Hevea Brasiliensis* produces under normal conditions, say, 4 pounds of rubber per year. An acre planted with 100 trees will produce 400 pounds a year, and five acres will produce one ton. The United States consumes about 50,000 tons yearly. This can be produced on 250,000 acres with 25,000,000 bearing trees.

The shaded portions of the map show where the *Hevea* is or could be cultivated profitably. The map indicates regions along important rivers or near the coast that are easily accessible. Millions of acres of good land are thus shown. Vast tracts away from the rivers are also available.

THE RUBBER TRADE IN CANADA.

CANADIAN imports and exports of india rubber, gutta percha and manufactures of, for six months ending September 30, 1914, by countries, are officially stated to have been in value as follows:

	IMPORTS—FREE			
	United States	Great Britain	Other Countries	Total Value
Crude rubber and gutta percha.....	\$1,182,746	\$267,351	\$56,059	\$1,506,156
Reclaimed	386,913	1,933	161	389,007
Waste	53,681	25	209	53,915
Other	21,935	16	.....	21,952
Total	\$1,645,276	\$269,325	\$56,429	\$1,971,030

	IMPORTS—DUTYABLE			
Belting	\$53,579	\$3,895	\$.....	\$57,474
Boots and shoes	53,181	11,569	10	64,760
Clothing and waterproof cloth	29,540	466,700	502	496,742
Elastic	11,995	62,701	792	75,488
Hose	59,124	2,433	.....	61,557
Tires	789,158	26,132	96,534	911,824
All other	341,661	138,457	29,401	509,519
Total	\$1,338,238	\$711,887	\$127,239	\$2,177,364

EXPORTS OF CANADIAN PRODUCE.				
Belting	\$68	\$95	\$1,007	\$1,170
Boots and shoes	8,907	892	62,809	72,608
Waste	195,638	.....	.....	195,638
All other	38,035	6,426	11,398	55,859
Total	\$242,648	\$7,413	\$75,214	\$325,275

RE-EXPORTS.				
Belting	\$514	\$.....	\$384	\$898
Boots and shoes	657	.....	65	722
Waste	336	.....	.....	336
All other	45,591	1,449	2,865	49,905
Total	\$47,098	\$1,449	\$3,314	\$51,861



MAP SHOWING TERRITORY AVAILABLE FOR *Hevea* PLANTING NEAR HOME

THE MARKET FOR CHEMICALS AND COMPOUNDING INGREDIENTS.

THE market is not very active at present. The most important feature is the question of freight rates and cargo space for the shipment of European chemical products. Freight rates are increasing and cargo space is becoming almost impossible to obtain, indicating a resumption of general commerce. With the German commercial fleet tied up and many boats of the Allies commandeered for war purposes there is not sufficient accommodation for the freights offering. Notwithstanding the above it must be noted that the general trend of both domestic and imported chemicals is tending downward.

Pigments generally are quiet and whiting has advanced. Some foreign grades of zincs have arrived, but as spelter and zinc ore have risen these products are quite firm. Foreign barytes is still arriving in spite of previous notice that no more would be shipped.

PRICES OF CHEMICALS AND COMPOUNDING INGREDIENTS.

JANUARY 30, 1915.

Acetic acid, 28 per cent.....lb.	\$ 0.0134 @ \$ 0.02
Acetic acid, glacial.....lb.	.0734 @ .0814
Acetone.....lb.	.18 @ .20
Alba whiting.....ton	8.00 @ 13.00
Aluminum flake.....lb.	.0134 @ .01
Aniline oil.....lb.	.60 @ .65
Antimony, crimson, sulphuret of.....lb.	.40 @ .50
Antimony, golden, sulphuret of.....lb.	.28 @ .35
Arsenic sulphide.....lb.	.12 @ .15
Asbestine.....ton	16.00 @ 18.00
Barytes, domestic.....ton	17.00 @ 18.00
Bayberry wax.....lb.	.24 @ .27
Beeswax, crude yellow.....lb.	.28 @ .30
Benzol, 90 per cent.....gal.	.30 @ .35
Black hypo.....lb.	.27 @ .30
Blanc fixe.....lb.	.0375 @ .04
Cadmium, yellow.....lb.	1.25 @ 1.50
Carbon bi-sulphide.....lb.	.06 @ .07
Carbon gas.....lb.	.04 @ .06
Carbon tetra-chloride, drums.....lb.	.15 @ .16
Ceresin wax, white.....lb.	.15 @ .25
Chalk, L. B.....lb.	.0412 @ .0512
China clay, domestic.....ton	8.00 @ 9.00
Coal tar naphtha.....gal.	.28 @ .30
Corn oil.....lb.	.05 @ .0534
Fossil flour.....ton	35.00 @ 40.00
Fossil flour, bolted.....ton	60.00 @ 65.00
Glycerine, C. P., bulk.....lb.	.22 @ .2212
Graphite.....lb.	.40 @ .60
Green oxide of chromium.....lb.	.30 @ .35
Iron oxide.....lb.	.0212 @ .0812
Infusorial earth.....ton	30.00 @ 35.00
Ivory, black.....lb.	.08 @ .12
Lampblack.....lb.	.0334 @ .07
Lead, sublimed white.....lb.	.07 @ .08
Lead, white (basic carbonate).....lb.	.05 @ .0514
Lead, white (basic sulphate).....lb.	.0434 @ .05
Linseed oil, carload.....gal.	.59 @ .60
Litharge.....lb.	.05 @ .06
Lithopone, American.....lb.	.0334 @ .0412
Lithopone, imported.....lb.	.0412 @ .0512
Magnesia, carbonate.....lb.	.0434 @ .0512
Magnesia, calcined, powder.....ton	40.00 @ 45.00
Naphtha, V. M. & P., deodorized.....gal.	.09 @ .10
Naphtha, 70 deg.....gal.	.23 @ .24
Naphtha, 76 deg.....gal.	.24 @ .25
Orange mineral, domestic.....lb.	.0812 @ .12
Ozokerite, refined yellow.....lb.	.25 @ .30
Paraffine wax, domestic 120 m. p.....lb.	.0412 @ .0434
Pumice stone, powder.....lb.	.0112 @ .02
Prussian blue.....lb.	.46 @ .48
Rape seed oil, blown.....gal.	.73 @ .74
Red lead, domestic.....lb.	.0512 @ .06
Red oxide, domestic.....lb.	.0512 @ .07
Rosin oil.....gal.	.25 @ .55
Shellac, fine orange.....lb.	.17 @ .19
Soapstone, powdered.....ton	10.00 @ 12.00
Sulphur chloride, in drums.....lb.	.0612 @ .08

Sulphur, flowers.....cwt	2.20 @ 2.60
Talc, American.....ton	10.00 @ 15.00
Ultramarine blue.....lb.	.0312 @ .13
Vermilion, English.....lb.	.90 @ 1.00
Whiting, commercial.....cwt.	.45 @ .55
Whiting, Paris white.....cwt.	.70 @ .75
Whiting, English cliffstone.....cwt.	.75 @ 1.00
Zinc oxide, American process.....lb.	.0534 @ .06
Zinc oxide, French process, red seal.....lb.	.07 @ .08
Zinc oxide, French process, green seal.....lb.	.0712 @ .08
Zinc oxide, French process, white seal.....lb.	.08 @ .09

RUBBER STATISTICS FOR THE UNITED STATES.

IMPORTS OF RUBBER AND MANUFACTURES OF.

ARTICLES.	November, 1914.		Eleven Months Ending November, 1914.	
	Quantity.	Value.	Quantity.	Value.
India rubber, etc., and substitutes for, and manufactures of:				
Unmanufactured—				
Balata.....pounds, free	336,306	\$110,821	1,815,156	\$805,502
Guayule gum.....	230,700	68,255	1,533,371	573,656
Gutta-jelutong.....	.....	.....	17,471,331	806,189
Gutta-percha.....	78,161	12,890	1,876,677	327,564
India rubber.....	12,253,509	5,517,024	131,481,364	65,333,751
India rubber scrap or refuse, fit only for remanufacture	1,054,683	73,671	18,559,353	1,327,775
Total unmanufactured	.....	\$5,782,661	.....	\$69,174,437
Manufactures of—				
Gutta-percha.....dutiable	.....	\$2,530	.....	\$22,475
India rubber.....	.....	68,098	.....	1,310,332
Total manufactures of	.....	\$70,628	.....	\$1,332,807
Substitutes, elasticon and similar.....dutiable	.....	\$1,894	.....	\$61,672

IMPORTS OF CRUDE RUBBER BY COUNTRIES.

From:				
Belgium.....pounds	.....	.....	9,018,596	\$5,028,504
France.....	.....	.....	2,107,247	899,281
Germany.....	.....	.....	4,631,589	2,336,218
Portugal.....	132,627	\$38,152	1,225,206	366,313
United Kingdom.....	6,295,418	3,130,256	50,700,629	28,921,299
Central American States and British Honduras.....	5,050	1,343	430,068	200,852
Mexico.....	464,204	148,090	1,249,848	488,153
Brazil.....	2,965,549	1,142,743	38,344,443	14,940,001
Other South America.....	875,295	363,798	2,793,258	1,123,619
East Indies.....	1,481,067	680,894	19,264,890	10,082,953
Other countries.....	34,299	11,748	1,715,590	946,558
Total.....	12,253,509	\$5,517,024	131,481,364	\$65,333,751

EXPORTS OF AMERICAN RUBBER GOODS.

India rubber, manufactures of:				
Scrap and old.....pounds	15,630	\$2,325	4,071,701	\$396,062
Reclaimed.....	605,886	83,104	5,711,614	803,622
Belting, hose and packing.....	.....	171,100	.....	1,994,840
Boots and shoes—				
Boots.....pairs	54,707	114,524	209,894	502,935
Shoes.....	155,155	89,226	1,203,264	652,177
Tires—				
For automobiles.....	.....	210,308	.....	3,014,220
All other.....	.....	31,887	.....	420,290
All other manufactures of.....	.....	284,184	.....	2,789,692
Total.....	.....	\$986,658	.....	\$10,573,838

EXPORTS OF AUTOMOBILE TIRES BY COUNTRIES.

India rubber, manufactures of:				
Tires for automobiles—				
Belgium.....	.....	.....	.....	\$301
Germany.....	.....	.....	.....	81,917
England.....	\$100,970	.....	.....	1,275,925
Canada.....	19,408	.....	.....	852,473
Mexico.....	10,283	.....	.....	70,240
Philippine Islands.....	15,559	.....	.....	139,869
Other countries.....	64,088	.....	.....	593,495
Total.....	.....	\$210,308	.....	\$3,014,220

EXPORTS OF FOREIGN MERCHANDISE.

India rubber, etc., and substitutes for, and manufactures of:				
Unmanufactured—				
Balata.....pounds, free	62,740	\$21,464	430,396	\$202,327
Guayule gum.....	.....	.....	2,250	1,058
Gutta-jelutong.....	.....	.....	.....	.....
Gutta-percha.....	.....	.....	11,163	5,653
India rubber.....	1,130,605	606,053	5,236,768	2,937,510
India rubber scrap or refuse, fit only for remanufacture	.....	.....	324	8
Total unmanufactured	.....	\$627,517	.....	\$3,146,556
Manufactures of—				
Gutta-percha.....dutiable	.....	.....	.....	.....
India rubber.....	.....	\$780	.....	\$4,902
Substitutes, elasticon and similar.....	.....	.....	.....	.....

Crude Rubber During 1914.

THE year 1914 opened with a normal market for crude rubber, both as to prices and receipts and under the ordinary fluctuations, prices had receded by the end of June to 67 cents for Upriver fine and 57 cents for First latex crepe.

At the opening of the war, during the early days of August, a most remarkable rise in crude rubber quotations took place, the price of Upriver fine jumping in a few days to \$1.25, while First latex crepe had followed it to \$1.23 per pound.

These figures ruled for but little over a week and although the demand on the part of manufacturers was active sales were comparatively small and were reported at \$1.10 to \$1.20. Imports of all kinds during the month amounted to 3,224 tons.

By the middle of August the receipt of several large consignments and the expectation of further arrivals broke the market. Upriver fine quickly dropped to 90, First latex crepe reached the same figure and from this time a steady decline set in for both Upriver fine and First latex.

These extreme variations in price took place without any panic or extraordinary disturbance in the market. Realizing the inevitable result of the interruption of shipments, due to the hostile disturbance of oversea commerce, the embargo, etc., manufacturers prudently withdrew from the market toward the close of October, working up their stocks and refraining, as far as possible from buying in the hope that efforts being made would result in the early removal of the embargo.

The chart printed herewith and accompanying tables will make the movement of crude rubber in 1914 as compared with the preceding year perfectly clear. The heavy line indicates the fluctuations in Upriver fine in 1914, the heavy dotted line the variations of First latex crepe for the same period; the lighter lines show the movement on the same grades for 1913.

Early in November Upriver fine sold for 66 cents and First latex crepe at 64 cents. During the month prices advanced steadily, until the first week in December, when Upriver fine stood at 70 cents and First crepe was strong at 75 cents. The market was decidedly feverish at first but later in the month it was strengthened by prospects of early shipments, and First latex advanced to 88 cents, with Upriver strong at 74 cents. The manufacturers accepted the uncertain situation coolly and drew on their reserve stocks. Inquiries were plentiful but few actual sales were made. The month closed with Upriver fine at 73 cents and First latex at 85 cents, both on a steady market marked by small stocks and few buyers.

The belief that the embargo would soon be lifted dominated both buyer and seller. All shipments of plantation rubber from London and Singapore have ceased. Pará sorts from Brazil were arriving, but had been sold in advance, and therefore had no effect on the market.

In regard to the financial situation, Albert B. Beers (broker in crude rubber and commercial paper, No. 68 William street, New York), advises as follows: "During January the same improved market conditions for commercial paper, noted for December, have continued, with further ease, the best rubber names going at $4\frac{1}{2}$ to 5 per cent., and those not so well known at $5\frac{1}{2}$ to 6 per cent."

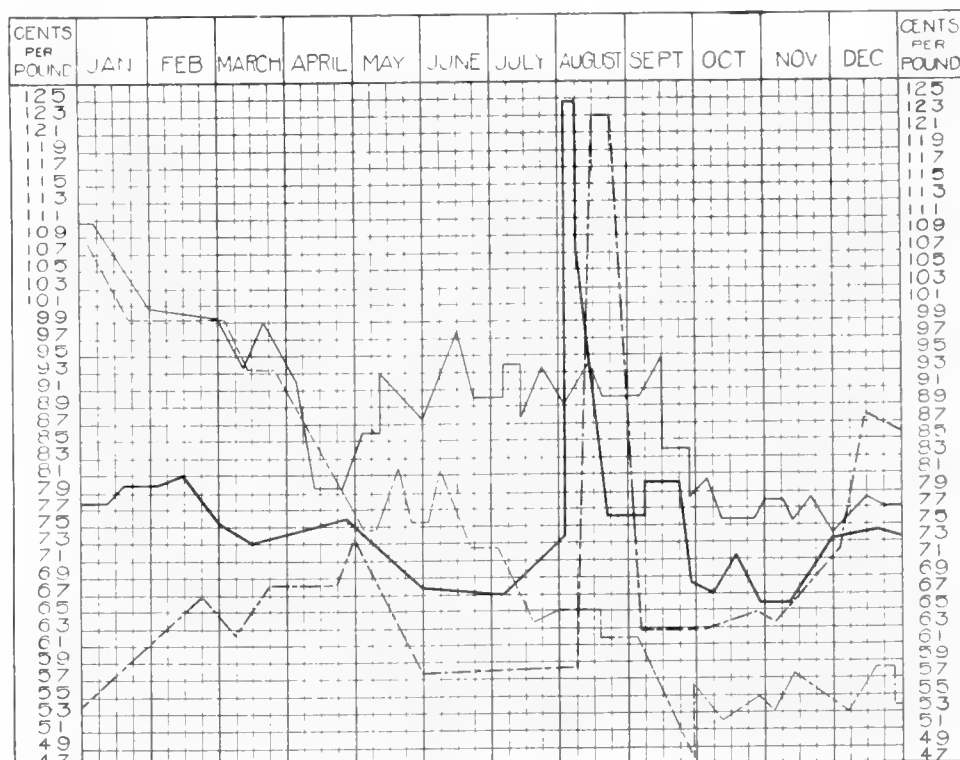
PRICES FOR DECEMBER (NEW RUBBER).

	1914.	1913	1912
Upriver, fine	\$0.70 to 0.76	\$0.72 to 0.76	\$1.06 to 1.12
Upriver, coarse .....	.51 to .58	.44 to .47	.82 to .88
Islands, fine .....	.59 to .70	.59 to .66	.96 to 1.07
Islands, coarse .....	.31 to .38	.27 to .30	.54 to .58
Cameta .....	.34 to .41	.35 to .37	.56 to .60

SUMMARY OF NEW YORK RUBBER PRICES FOR 1914

	UPRIVER		ISLANDS		CAMETA.
	Fine.	Coarse	Fine.	Coarse.	
January . . .	\$0.73 to 0.77	\$0.44 to 0.47	\$0.59 to 0.65	\$0.27 to 0.31	\$0.35 to 0.37
February . . .	.75 to .79	.46 to .47	.64 to .69	.31 to .32	.35 to .38
March . . . .	.73 to .76	.43 to .46	.68 to .70	.31 to .33	.35 to .36
April . . . . .	.74 to .76	.44 to .47	.69 to .73	.31 to .34	.35 to .37
May . . . . .	.70 to .74	.42 to .46	.69 to .72	.29 to .32	.33 to .37
June . . . . .	.69 to .71	.40 to .42	.58 to .62	.27 to .29	.31 to .34
July . . . . .	.68 to .75	.40 to .42	.57 to .60	.27 to .30	.30 to .34
August . . . .	.75 to 1.15	.43 to .89	.60 to 1.00	.30 to .60	.32 to .61
September . .	.64 to .78	.43 to .55	.53 to .70	.27 to .35	.29 to .36
October . . . .	.64 to .66	.43 to .47	.49 to .53	.26 to .28	.29 to .32
November . . .	.63 to .71	.46 to .53	.50 to .61	.27 to .32	.29 to .34
December . . .	.70 to .76	.51 to .58	.59 to .70	.31 to .38	.34 to .41

	AVERAGE PRICES.
1914.....	\$0.73 3/4
1913.....	.87 1/4
1912.....	1.11 3/4
1911.....	1.18 1/4
1910.....	2.01 1/4
1909.....	1.59 3/4



Compiled by Gould Commercial Co., New York.

1914
Upriver Fine —————
First Latex Crepe - - - - -

1913
Upriver Fine —————
First Latex Crepe - - - - -

CHART SHOWING FLUCTUATIONS IN PARA AND PLANTATION RUBBER FOR TWO YEARS—
SPOT PRICES.

OFFICIAL STATISTICS OF UNITED STATES COMMERCE IN CRUDE RUBBER, ETC., FOR 1914.

IMPORTS	India Rubber.	Balata.	Guayule.	Gutta Jelutong (Pontanarak.)	Gutta Percha.	Scrap Rubber.
January	8,114,047	95,094	557,755	939,371	960,467	1,425,242
February	8,443,898	101,700	27,558	1,307,670	83,983	1,219,261
March	10,771,741	117,266	6,000	2,200,452	414,609	2,307,892
April	6,641,714	103,656	.....	2,381,079	110,698	2,074,825
May	10,271,140	76,610	.....	2,308,190	293,920	2,945,904
June	9,428,709	106,295	59,910	1,477,881	176,052	2,596,809
July	9,879,114	53,820	.....	1,393,515	172,334	2,045,045
August	6,654,878	173,896	11,779	1,353,315	103,000	1,139,445
September	14,087,980	318,175	413,474	1,268,165	104,153	797,245
October	14,883,687	381,708	226,995	545,612	40,998	967,994
November	11,351,809	336,306	230,700	.....	78,161	1,054,683
December	11,883,797	200,000	742,169	1,192,567	46,461	559,613
Total	113,668,161	3,015,158	2,275,540	17,889,817	1,923,138	19,133,966
EXPORTS:						
January, 1914	Points	207,034	.....	.....	.....	.....
February	.....	464,496	30,774	.....	.....	.....
March	.....	398,768	32,081	.....	.....	.....
April	.....	439,857	4,000	.....	330	.....
May	.....	453,365	17,956	.....	5,133	.....
June	.....	389,657	.....	.....	.....	40,426
July	.....	320,361	6,379	.....	.....	.....
August	.....	458,635	.....	.....	.....	.....
September	.....	367,751	98,103	.....	3,460	.....
October	.....	851,093	166,066	.....	.....	.....
November	.....	1,130,605	62,740	.....	.....	.....
December	.....	628,248	147,051	.....	.....	.....
Total	.....	5,800,870	565,150	.....	330	40,426

COMPARATIVE RUBBER STATISTICS.

[From the Annual Statistical Summary of Meyer & Brown, New York.]

	Comparative Rates of Fine Para.		Total Exports	Total Imports Into the United States.			
			from Para.				
	Liverpool	New York.	Para Weights.	Para Grades, Excluding Caucho.	Cent. E. I. Af. and Caucho.	Plantation Ceylon.	Guayule.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
1897	3 5 to 3 9	\$0.79½ to \$0.89	22,630	10,491	7,180	.....	.....
1898	3 7 to 4 5	.82 to 1.06	21,890	9,739	8,881	.....	.....
1899	3 10 to 4 7¼	.91 to 1.10	23,115	12,498	10,597	.....	.....
1900	3 8½ to 4 9	.83 to 1.11½	6,727	11,985	8,483	.....	.....
1901	3 4 to 3 11½	.76 to .95	30,296	13,142	10,066	.....	.....
1902	2 10 to 3 9½	.66 to .92	28,668	12,901	8,941	.....	.....
1903	3 6 to 4 8	.78 to 1.13	31,079	13,934	10,826	.....	.....
1904	3 10 to 5 6	.89 to 1.32	29,984	14,367	13,256	.....	.....
1905	4 10 to 5 8¼	1.13 to 1.35	33,913	13,881	14,754	.....	.....
1906	4 11 to 5 5½	1.16 to 1.28	35,251	15,128	14,808	.....	.....
1907	2 11½ to 5 3	.69 to 1.24	37,321	15,118	14,315	.....	2,992
1908	2 9 to 5 3	.65 to 1.30	38,848	17,316	12,161	.....	3,850
1909	4 16 to 9	1.13 to 2.15	39,287	17,591	11,808	1,730	8,674
1910	4 10 to 12 4½	1.16 to 2.90	37,954	14,896	14,409	3,611	10,656
1911	3 10 to 7 1	.90 to 1.67	35,936	15,892	12,640	6,556	8,091
1912	3 11 to 5 1	.93 to 1.22	43,467	19,241	15,807	15,003	6,105
1913	2 5½ to 4 6¼	.59 to 1.10	39,223	15,329	9,428	23,967	2,756
1914	..... to .....	.49 to 1.15	37,215	15,760	9,290	35,326	850

MONTHLY IMPORTATIONS OF RUBBER TO THE UNITED STATES FOR THE LAST SIX YEARS (IN TONS).

Imports	Jan.	Feb.	March	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.	Total.
1909	1,293	1,818	849	923	561	927	369	318	785	836	1,259	2,014	11,982
1910	1,346	1,412	5,319	423	207	182	361	366	524	858	1,117	1,147	10,274
1911	896	701	638	382	498	1,105	795	754	935	1,498	1,376	1,250	10,818
1912	1,778	1,657	1,304	1,240	676	767	701	844	866	1,056	1,105	1,241	13,185
1913	1,334	1,380	899	749	499	665	452	566	757	877	1,120	774	10,072
1914	907	613	1,182	784	869	535	469	610	963	1,146	1,100	836	10,107
Gross Para													
1909	576	700	435	534	509	657	247	181	375	361	439	642	5,609
1910	657	504	842	150	123	196	276	281	458	386	363	386	4,622
1911	459	469	384	326	413	436	370	421	439	421	499	444	5,074
1912	657	641	780	516	438	537	375	469	497	356	469	415	6,056
1913	606	665	456	428	406	403	437	404	301	270	468	413	5,257
1914	492	341	754	432	596	304	426	182	364	369	418	485	5,153
Plantation Ceylon													
1909	46	64	74	45	134	160	185	94	94	266	150	234	1,730
1910	73	179	214	548	134	234	483	281	317	307	416	366	3,611
1911	339	417	616	518	688	489	460	470	614	697	551	697	6,556
1912	860	976	986	1,786	1,780	676	849	933	1,153	1,568	1,735	2,235	15,003
1913	611	1,358	1,078	1,861	1,700	1,700	1,798	1,979	1,334	2,214	2,373	2,708	23,967
1914	165	278	3,139	4,407	4,105	2,493	2,204	2,032	3,989	3,360	2,327	2,133	35,326
Gutta Jelutong (Ceylon)													
1909	741	93	610	373	380	256	219	235	361	251	539	4,961	
1910	31	699	367	75	335	181	405	365	249	262	175	4,636	
1911	393	377	446	476	245	191	359	318	369	300	376	4,316	
1912	660	700	899	669	477	491	468	476	461	403	615	6,469	
1913	678	177	438	549	649	549	342	268	297	329	209	5,022	
1914	48	44	745	960	872	381	400	276	530	267	392	370	5,685
Gutta Percha													
1909	44	9	61	474	477	536	600	505	915	763	571	623	6,847
1910	2,449	1,600	1,141	873	490	376	719	835	774	642	517	686	9,773
1911	300	467	1,108	676	678	580	565	677	949	991	412	791	8,324
1912	1,075	1,046	1,091	1,356	650	576	484	669	726	555	463	700	9,338
1913	876	9	300	476	277	303	260	218	240	186	410	4,406	
1914	18	78	30	801	316	192	176	134	229	217	162	380	3,605

CONSUMPTION OF INDIA RUBBER BY UNITED STATES AND CANADA IN TONS

From the Annual Statistical Service of the U. S. Bureau of Census, New York, 1914.

DEBITS	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924
Imports to United States	31,508	31,847	42,560	7,673	8,760	10,000	11,000	12,000	13,000	14,000	15,000	16,000	17,000	18,000
Exports to Liverpool and Continent	680	436	690	274	370	470	570	670	770	870	970	1,070	1,170	1,270
Add Stock on January 1	1,308	1,412	24,270	27,349	28,278	28,311	28,875	28,997	30,448	31,576	34,265	49,621	48,426	58,921
Less Stock close of Year	1,198	1,306	331	56	70	84	98	112	126	140	154	168	182	196
Deliveries to Manufacturers (Rubber)	31,796	31,811	42,601	27,600	8,288	8,726	9,130	9,530	10,000	10,436	11,111	12,453	13,244	14,125
Deliveries to Manufacturers (Guayule)	1,399	431	59	303	732	734	734	734	734	734	734	734	734	734
Total Rubber and Guayule	33,195	32,242	42,660	27,903	9,020	9,460	9,864	10,264	10,734	11,170	11,845	13,187	13,978	14,859

LONDON VIEW OF THE 1914 MARKET.

DURING the year just closed plantation grades have again occupied the predominant place in the world's rubber markets and with contributions calculated at about 65,000 tons to a world's output computed at about 115,500 tons, have therefore supplied a very large proportion of the demand.

The progress of this increase for seven successive years, from 1908 to 1914 inclusive, as shown in the exports of plantation rubber from the sources of production appears in the following figures, for which we are indebted to the annual market reviews published by S. Figgis & Co., Gow, Wilson & Stanton, Limited, and Hale & Sons, all of London.

	1914.	1913.	1912.	1911.	1910.	1909.	1908.
Exported from							
Ceylon (and							
India) tons.	14,800	11,830	6,300	2,750	1,430	600	350
Exported from							
Malaya, etc.	49,700	36,200	22,200	11,400	6,800	3,250	1,450
	64,500	48,030	28,500	14,150	8,230	3,850	1,800

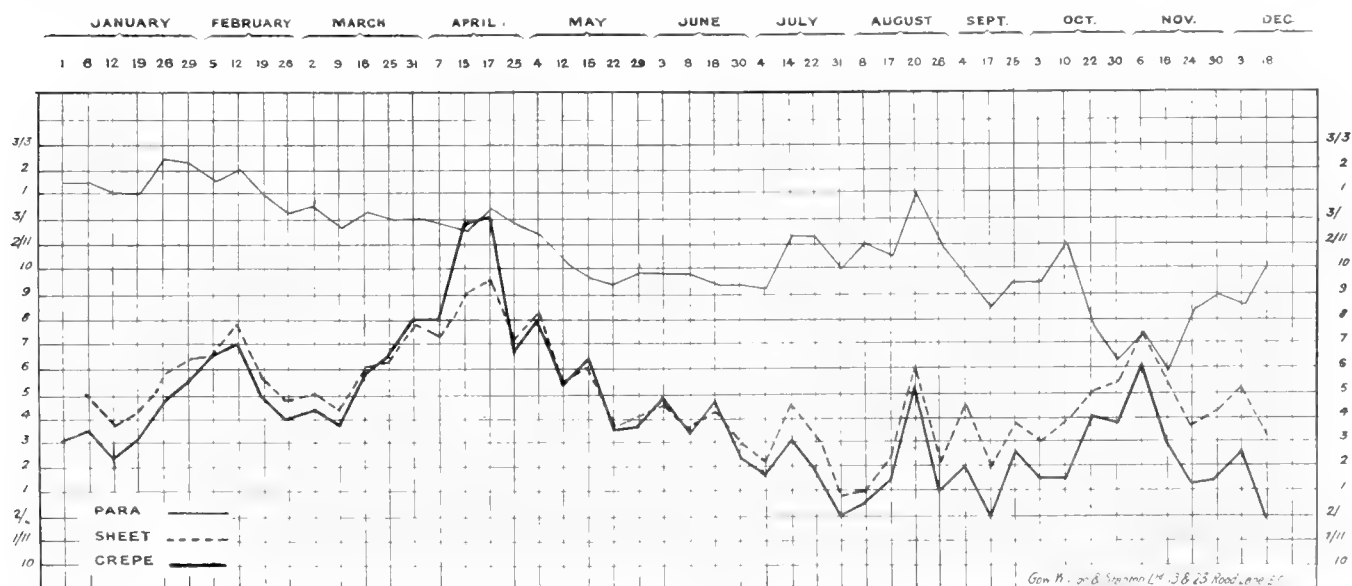
To the above there are to be added some direct shipments of plantation rubber made from the Dutch East Indies. During the year 1914, according to the same report, there were shipped from Amazonas and Brazil 37,000 tons, from West Africa 8,500 tons and from various other sources 4,500 tons. The exports from Brazil for the past five years have been, in tons, as follows: 1914, 37,000; 1913, 39,000; 1912, 40,500; 1911, 39,500; 1910, 40,500.

While the sales of plantation rubber, according to figures above

given, have been steadily growing for the past few years, fluctuations in price in the London market were more limited in extent last year than during the preceding twelve months. The range was from 1s 11¹/₂d to 3s for standard crepe, whereas in 1913, while the minimum was the same, the highest price reached was 4s 6¹/₂d. Prices for sheet ruled about 3¹/₄d. higher. It was during the latter part of April that a temporary shortage in the supply resulted in the high figures above quoted. But after this a steady decline set in, due to unfavorable political and financial conditions, to which must be added the effects of a widespread strike in Russian rubber goods factories; and this led to the low price quoted being reached in June.

Soon after this came the war, with its interruption of shipments and general demoralization of the market, from which it has not completely recovered, and which has made statistics either very incomplete and unreliable or altogether unobtainable.

One thing has been demonstrated by the constraint placed upon manufacturers to use the plantation product, and that is a preference that exists in many instances for the Brazilian and wild rubbers and a willingness to pay more for them than for the plantation article. That this is due to the fact that to the smoking to which the wild rubber is subjected as part of the curing process is attributed a beneficial effect on its quality is certain, and various attempts have been made by rubber men and inventors to perfect a process of smoke curing adapted to plantation rubber or to devise some other means of treating the latex so as to produce the properties the manufacturer esteems in the smoke-cured product. Although various methods have been suggested and quite a number of processes and apparatuses patented, including mechanical and chemical methods of divers



FLUCTUATION IN PRICES OF STANDARD PLANTATION GRADES AND FINE HARD PARA RUBBER DURING 1914

characters, no one process has as yet been perfected that meets every requirement.

That the extensive introduction of plantation rubber and the improvement in its quality, due in large measure to the researches above referred to, has seriously affected the market price of the wild product, will be evident from the following table, the figures in which are from Figgis & Co.'s report, and which show the steady decline in the prices paid for wild rubber during the past five years:

	Hard fine Pará.	Negrohead Scrappy.	Negrohead Island.	Caucho Ball.
1910.....	5s.	4s. 2d.	2s. 10d.	4s. 2½d.
1911.....	4s. 3½d.	3s. 9d.	2s. 7d.	3s. 9½d.
1912.....	4s. 6½d.	3s. 5½d.	2s. 3d.	3s. 6½d.
1913.....	3s. 1½d.	2s. 6d.	1s. 5d.	1s. 11d.
1914.....	2s. 10½d.	2s. 1½d.	1s. 3d.	2s. 4d.

Considering the many serious disadvantages that have confronted the trade during the past few months, the steadiness that has characterized the markets is indeed remarkable, and it is hardly expected that the probable resumption of shipments, under the conditions arranged between the British government and the embargo committee of the Rubber Club of America—of which a full account will be found elsewhere in the present number—will cause serious disturbance in prices or conditions.

The efforts made by planters to improve the quality of their product with a view to more effective competition with forest rubber have not been without indirect effect on trade conditions. Reference may here be made to the proposition, of which more or less is heard, that the raw latex, or partly prepared raw rubber, be sent to a central establishment for final treatment and for distribution. These suggestions are all more or less in line with the idea of rubber standardization, which has many advocates in trade circles. A commission appointed by the Rubber Growers' Association of London recently presented a report in which they discussed the advisability of establishing a central laboratory, or testing bureau, for the appraisal and grading of rubber according to standards of quality to be established, and it is not improbable that eventually something may develop from this proposition.

The production of an artificial substitute for india rubber has received during the past year about the usual amount of attention, but there is no substantial progress to be recorded, except the recognition of the importance of the turpentine products of the United States, as a future possible source of isoprene, which is regarded as the only scientific basis of synthetic rubber. The present status of the research is not regarded by rubber producers as a source of anxiety, in spite of the fact that rubber manufacturers have of late manifested greater interest in its possibilities.

For the current year prospects may be pronounced good. The slight decline in the South American output last year is not traceable to any specific cause, and may be only a normal fluctuation, the shipments from those parts having displayed only slight variations, and those mainly in an upward direction, for the past decade. The monthly fluctuations in price of the South American rubbers were not abnormally great, the highest figure paid for hard fine during 1914 having been 3s. 2½d.; the lowest price at which it sold during the same period being 2s. 6d. The highest price realized for soft fine was 3s. 0½d., and it declined to 2s. 0½d. at the close of the year. Caucho ball, which at the opening of the year was in good supply and selling at a fairly low price, fell off in quantity towards the close of the period, and in December attained its highest figure, 2s. 4d.

Owing to the disturbed condition of affairs, Mexico has ceased to be a factor in the consideration of the guayule supply.

Judging from the estimates of probable crops for the current year embodied in the last annual reports by the different planting companies in the Far East, the increase in acreage under cultivation and ready for tapping, and their improved methods of

preparation, growers in that section, provided they escape unforeseen plantation troubles, promise to produce at least as much rubber this year as last, and the quality is likely to show a steady improvement.

The following table shows the acreage under cultivation in all rubber-growing countries during the past five years, by which it will be seen that Malaya and Dutch East Indies show the only notable increase in the area under cultivation.

	1910.	1911.	1912.	1913.	1914.
Ceylon acres	200,000	210,000	220,000	220,000	220,000
Malaya, Malacca, etc...	290,000	350,000	430,000	500,000	500,000
Borneo	12,000	20,000	20,000	20,000	20,000
Dutch East Indies, Java, Sumatra, etc.....	185,000	200,000	230,000	400,000	400,000
India and Burmah.....	30,000	40,000	40,000	45,000	65,000
German Colonies, Samoa, East and West Africa.	45,000	45,000	42,000	60,000	40,000

Total acreage planted. 757,000 865,000 782,000 1,245,000 1,245,000

Under the circumstances it seems justifiable to estimate the world's rubber crop for the past year at the figure previously quoted, viz., 115,000 tons, in round figures. Assuming a return to normal conditions, the distribution of the available supply will be about as follows:

England	tons	24,000
Germany, Austria, etc.....		13,000
France		8,000
Russia		14,000
Italy, etc.		2,500
Japan and Australia.....		3,000
United States and Canada.....		51,000

Total 115,500

The sources of this estimated supply are given as follows:

Plantation	tons	65,500
Amazonas and Brazil.....		37,000
West African		8,500
Mattogrosso, Manicoba, Assare, etc.....		1,800
East African, Manihot, etc., Penang, Borneo, Rangoon, Assam, Madagascar, etc.....		1,500
Central American, Mexican, etc.....		1,200

Total 115,500

To this must be added considerable quantities of reclaimed rubber, but less than in 1913.

No account is taken in this computation of stocks in hand for the reason that it is impossible to ascertain how much of the rubber stored in the various foreign ports is already sold and is being held awaiting opportunity for shipment.

As next to the United States and Canada, the largest consumer of crude rubber, the imports of Great Britain and their origin are of more than passing interest to American consumers, and are shown in the accompanying table, which gives the imports and deliveries for five years.

	Imports.	Deliveries.
1910..... tons	32,659	29,980
1911.....	33,964	34,054
1912.....	43,853	44,238
1913.....	55,270	52,854
1914.....	59,409	58,045

Great Britain's importations for 1914 were derived from the following sources:

East India, Malaya, Ceylon, etc.....	tons	41,894
Pará and Manáos.....		9,251
Peru Caucho		3,437
West Coast Africa.....		2,641
All others		2,186

Total 59,409

MOVEMENTS OF RUBBER IN THE UNITED KINGDOM.

[As estimated by Gow, Wilson & Stanton, Limited, London.]

From—	December			Twelve Months Ending December.		
	1912.	1913.	1914.	1912.	1913.	1914.
French West Africa.....	133	43	20	1,507	1,009	281
Peru.....	303	194	51	1,605	1,301	693
Brazil.....	1,538	1,36	89	15,174	11,768	12,385
Gold Coast.....	9	14	5	784	667	252
Straits Settlement.....	1,067	1,347	3,250	10,671	15,103	21,143
Federated Malay States.....	861	743	928	6,354	9,880	9,821
Ceylon.....	487	710	1,630	4,063	6,705	9,361
Other countries.....	1,678	1,371	1,176	14,865	19,391	13,686
Total Imports.....	5,761	8,799	7,941	55,023	65,824	67,662
Exports from United Kingdom, Dec.	2,790	3,876	1,763	36,298	45,012	49,974

TOTAL EXPORTS FROM MALAYA.

[From January to date named. Reported by Barlow & Co., Singapore. The figures include the production of the Federated Malay States, but not of Ceylon.]

To—	Singapore.		Malacca.		Penang.		Port Swet to Penang.		Total.
	Dec. 13.	Nov. 30.	Dec. 13.	Nov. 30.	Dec. 13.	Nov. 30.	Dec. 13.	Nov. 30.	
Great Britain, pounds.....	26,603,905	4,679,100	17,400,600	27,576,042	72,139,356				
Continent.....	1,923,883	36,875	533,333	1,816,538	4,310,596				
Japan.....	1,818,833				1,251,873				
Ceylon.....	267,48		841,333	1,499,888	2,638,466				
United States.....	10,733,448	1,878		24,769	11,904,036				
Australia.....	140,209				140,209				
Total.....	40,949,48	4,712,160	17,706,167	29,316,677	92,684,486				
Same period, 1913.....	6,053,873		1,978,467	25,459,448	64,197,38				
Same period, 1912.....	13,689,663		7,575,764	17,496,864	38,762,291				
Same period, 1911.....	6,009,206		6,057,932	10,813,755	20,888,613				

Plantation Rubber from the Far East.

EXPORTS OF CEYLON GROWN RUBBER.

[From January 1 to December 14, 1913 and 1914. Compiled by the Ceylon Chamber of Commerce.]

To—	1913.	1914.
Great Britain..... pounds.....	13,876,396	19,564,359
United States.....	5,745,870	9,175,991
Belgium.....	3,688,206	2,984,000
Australia.....	438,313	619,175
Germany.....	309,043	1,037,415
Japan.....	270,055	269,014
Straits Settlements.....	146,147	42,746
Italy.....	44,754	1,772
Austria.....	31,434	
France.....	15,682	320,152
Russia.....	11,301	105,212
India.....	1,381	1,050
Holland.....	92	
Total.....	24,579,664	34,120,895

(Same period, 1912 -13,167,917; same period 1911, 6,112,722.)

To arrive at the approximate quantity of Ceylon rubber exported for 1914 to date, deduct the quantity from the total exports. In previous years the exports of Ceylon rubber only were given.

The export figures of rubber for 1914 in the above table include the imports re-exported, viz., 3,581,356 pounds.

Review of the Crude Rubber Market.

NEW YORK.

WITH the embargo situation practically unchanged, the first week of the month passed quietly in the New York rubber market. Both buyers and sellers were patiently waiting. Spot prices were 80 cents for First latex crêpe, 75 cents for Upriver fine. The trend of prices, however, was downward, due to the conviction that shipments from England would soon be resumed. By the middle of the month First latex had dropped to 65 cents, caused by the favorable reports of an early agreement. By the 19th Upriver fine was 63 cents, in a declining market, created by actual shipments from London. Also, the report that holders of rubber paper in Brazil were getting nervous and unloading did not help Pará sorts.

The last week opened with a steady market and better interest in the attractive low prices offered. First latex crêpe was 61 cents for spot and 57 cents to arrive. Ribbed sheet was 65 for spot and 61 cents to arrive. Upriver fine for spot was 60@61 cents, Coarse 45½ cents and Caucho ball 46½ cents, with Centrals showing a heavy decline.

The undertone is firm and futures are in demand. It is very evident that the removal of the embargo had been largely anticipated. The official forms of the guarantee under which rubber can now be shipped from the United Kingdom are published elsewhere in this issue.

The month is closing with a firm undertone and many inquiries from manufacturers for all grades. The "Lusitania" arrived January 23, with 200 tons of plantation, consigned to the British Consul General. The trend of prices has been downward. Upriver fine actually sold at 59 cents a pound, and weakness is noticed in Brazilian sorts. First latex crêpe, spot, is quoted at 61 cents, and 57 for lots now afloat from London due to arrive the coming week. There is afloat 100 tons on the "Gregory" from Manaus and Pará—due February 5. The "Stephen," from the same ports, arrived January 28 with 740 tons. The "Sao Paulo," from Pará, is due to arrive February 3 with 340 tons. The "Menominee," with 1,500 tons, and the "Minneapolis," with 1,000 tons of Plantation, were to have sailed this week. Rumor has it that they are delayed on account of London dock strikes.

LONDON.

The London market opened steady, with Standard crêpe at 2s. for spot, and smoked sheet at 2s. 3½d. Hard fine Pará was offered at 2s. 11d. The prohibition of shipments to America dominated the whole situation. December imports of plantation were 4,877 tons, against 2,780 tons in November. Deliveries were 2,300 tons in December, against 2,306 in November. The stocks on January 1, 1915, were 6,251 tons, compared with 3,676 tons on November 30, 1914. Although no permits had been issued, large stocks, estimated at 2,000 tons, had been purchased and were held for American account. Rubber from the Far East is steadily piling up in London. The congestion at the dock is so great that after the ship's arrival there is a delay of 3 weeks before samples can be seen and the rubber sold.

The market continued strong, with good demand, under the belief of an early settlement of the embargo question. On the 15th Standard crêpe had advanced to 2s. 1¼d. for spot and forward delivery up to March. For April-June delivery, 2s. 1d., and 2s. ½d. for July-December. Smoked sheet closed at 2s. 4d. spot.

SINGAPORE.

There is interesting news from the Far East. The increase in production of plantation rubber in 1914 was 25 per cent. The figures are 64,500 tons, against 48,030 for 1913. From Singapore comes the announcement that in 1915 the 1910 plantings will be producing and under favorable conditions there will be at least 20,000 tons added to the world's production of plantation rubber. What will these steadily increasing supplies do to the future market?

There was good demand at the Singapore auction held December 1, 1914, marked by substantial advance in prices over those of last week. Of the 105 tons catalogued 70 tons were sold. The auction at Penang resulted in the sale of 43,600 pounds of smoked and unsmoked sheet, pale and low-grade crêpes.

Word comes from one of the large *Hevea* planters in the Far East that they have sold ahead all of the rubber to be produced on two plantations during the first 6 months of 1915, for 47½ cents a pound, First latex.

NEW YORK QUOTATIONS.

Following are the quotations at New York one year ago, one month ago, and January 30, the current date.

PARA.	Feb. 1, '14.	Jan. 1, '15.	Jan. 30, '15.
Islands, fine, new	64 @ 65	69 @ 70	53 @
Islands, fine, old			
Upriver, fine, new	75 @ 76	77 @ 75	60 @ 61
Upriver, fine, old	77 @ 80	78	
Islands, coarse, new	28 @ 29	37 @ 38	28 @ 29
Upriver, coarse, new	44 @ 45	59 @ 60	44 @ 45
Upriver, coarse, old			
Cameta	34 @ 35	40	32 @ 33
Caucho, upper	46 @ 47	61	45 @ 46
Caucho, lower		58	40 @ 41
PLANTATION HEVEA.			Spot.
Smoked sheet ribbed	62 @ 64	91 @ 93	65 @ 66
			Prompt Shpt.
			60 @ 61
			Spot.
First latex crepe	61 @ 62	86 @ 87	60 @ 61
			Prompt Shpt.
			56 @ 57
Fine sheets and biscuits			
un-smoked	60 @ 61		
CENTRALS.			
Corinto		58 @ 60	42 @ 43
Esmeralda, sausage	38 @ 39	58 @ 60	42 @ 43
Guayaquil, strip			
Nicaragua, scrap	36 @ 38		41 @
Panama			
Mexican plantation, sheet			
Mexican, scrap	35 @ 37	58 @ 60	
Mexican, slab			
Mangabeira, sheet		44 @ 45	37 1/2 @ 40
Guayule	35 @ 36	38 @ 39	29 @ 30
Balata, sheet		52 @ 53	53 @
Balata, block	45 @ 50	41 @ 42	42 @
AFRICAN.			
Lopori, ball, prime	53 @ 54	70 @ 75	58 @
Lopori, strip, prime			58 @
Aruwimi			
Upper Congo, ball red			
Ikelemba			
Sierra Leone, 1st quality			
Massai, red	50 @ 52		
Soudan Niggers	48 @ 52		
Cameroon, ball	31 @ 34	@ 55	43 @
Benguela		36 @ 38	
Madagascar, pinky			
Accra, flake	20 @ 21	@ 35	

OTHER NEW YORK ARRIVALS.

CENTRALS

[*This sign, in connection with imports of Centrals, denotes Gmavale rubber.]

EXPORTS.		Exports.
DECEMBER 29.—By the <i>Florida</i> —Columbia		
West Coast Rubber Co.	1,200	
McIntosh & Co.	500	1,700
DECEMBER 29.—By the <i>Florida</i> —Colum		
W. R. Grace & Co.	17,500	
DECEMBER 29.—By <i>El Alba</i> —Galveston:		
Various	280,000	
DECEMBER 3.—By the <i>Comodoro</i> —Puerto Cortez		
A. N. Rodriguez	1,200	
JANUARY.—By the <i>Comodoro</i> —Colum		
G. Amoroso & Co.	2,000	
Latex Corp., Johnson & Co.	2,400	
A. N. Capet & Sons	600	
J. S. Sullivan & Co.	400	
Monte Carlo Trading Co.	800	
P. G. Cayat & Co.	800	
West Coast Rubber Co.	800	
Comodoro K. C. & A. Co.	800	
Latex Corp. & Kopp	400	
Monte Carlo	400	77,400
JANUARY 1.—By the <i>Comodoro</i> —Galveston:		
Monte Carlo & B. A.	5,700	
Comodoro T. Wells & Co.	75,000	
Various	74,000	
JANUARY 1.—By the <i>Comodoro</i> —Galveston:		
Various	110,000	
JANUARY 4.—By the <i>Florida</i> —Galveston:		
Various	1,500	

EAST INDIAN.

EAST INDIA.	Feb. 1, '14.	Jan. 1, '15.	Jan. 30, '15.
Assam			
Pontianak	6@ 6 1/2	7 1/2 @ 8	7 1/2 @ 8

IMPORTS FROM PARA AT NEW YORK.

(The Figures Indicate Weight in Pounds.)

DECEMBER 29. By the steamer *Denis* from Para and Manaus.

	Fine.	Medium	Coarse	Caucho.	Total.
Meyer & Brown.....	166,200	36,900	147,700	44,600=	394,500
Arbely & Zeiss.....	219,400	29,500	41,400		307,000
Adams' Successors, Ltd.....	170,000	21,000	53,000	18,000=	262,000
General Rubber Co.....	148,100	25,500	17,400	2,400	193,400
Hagemeier & Bruhn.....	83,600		41,500	16,200=	141,300
Robinson & Co.....	52,000	7,800	14,500	2,600=	76,700
Henderson & Korn.....	7,300	18,400	37,000		62,900
G. Amersack & Co.....	50,300	2,100	8,900		61,300
Adolph Hirsch & Co.....	37,300	4,900	8,100	500=	47,800
Neuss, Hessel & Co.....	29,600			14,000=	43,600
W. R. Grace & Co.....	37,600	4,300			41,900
H. A. Aslett & Co.....	18,600	2,100	11,300	6,300=	38,300
Langstone, Whitworth, & Co.....	29,400	3,400	2,600		35,400
Birdsall Bros.....	5,000		1,600		6,600
Davies, Turner & Co.....	177,000		6,000	34,600=	217,600
Total.....	1,231,400	155,000	388,000	155,900=	1,930,300

JANUARY 9 - By the steamer *Sergipe* from Para

Arnold & Zeiss	99,400	11,200	31,400	2,400	144,400
Meyer & Brown	457,700	1,800	130,600	23,100	201,200
Henderson & Korn	40,500	11,700	31,900	500	90,600
Hagemeyer & Bruhn	15,400		11,200		26,600
H. A. Astlett & Co.	26,800	3,600	1,500	3,000	34,900
G. Amsinck & Co.	5,000		9,200		14,200
Davis, Turner & Co.	108,400		13,400		121,800
Total	347,200	28,300	229,200	29,000	633,700

JANUARY 15.—By the steamer *Boniface* from Para and Manaos.

Meyer & Brown.....	390,600	60,600	156,600	29,500=	637,300
Arnold & Zeiss.....	388,600	34,900	77,200	18,400=	519,100
Henderson & Korn.....	183,200	31,200	73,300	31,800=	319,500
Hagemeyer & Brunn.....	191,700		1,100	1,300=	194,100
H. A. Astlett & Co.....	90,500	35,600	29,900	21,200=	177,200
Johnstone, Whitworth & Co.	123,200	18,800	29,600	1,600=	173,200
General Rubber Co.....	107,800	15,800	11,900	900=	136,400
Robinson & Co.....	87,600	6,400			94,000
Aldens' Successors, Ltd....	36,000	4,000	35,000	3,000=	78,000
Crossman & Sieckin.....	28,900	1,800	9,100	300=	40,100
Adolph Hirsch & Co.....	24,700	7,200	4,000	1,500=	37,400
Robert Jadenhop.....	22,200	3,400	2,000	600=	28,200
G. Amsinck & Co.....	10,000		11,900	2,400=	24,300
W. R. Grace & Co.....	22,200	3,400	2,000		27,600
Total.....	1,707,200	223,100	443,600	112,500=	2,486,400

JANUARY 15.—By the steamer *Boniface* from Itacoatiara.

Robinson & Co.	6,900		300 =	7,200
Ross & Co.	10,400	900	2,000	13,300
H. A. Astlett & Co.			4,700	4,700
Total	17,300	900	6,700	25,200

OTHER NEW YORK ARRIVALS.			CENTRALS			OTHER NEW YORK ARRIVALS.		
JANUARY 4.—By the <i>Bahama</i> —Colon.			JANUARY 4.—By the <i>Alba</i> —Galveston.			JANUARY 12.—By <i>El Occidente</i> —New Orleans.		
M. L. Collantes	9,000		West Coast Rubber Co.	12,000		E. Steiger & Co.	21,000	
Various	5,000	14,000	Malonado & Co.	500	17,500	G. Amsinck & Co.	1,500	
JANUARY 5.—By the <i>Calumet</i> —Port Limón.			JANUARY 13.—By the <i>Albatross</i> —Galveston.			Various	42,000	64,500
Isid. Brindley & Bros.	800		Various		*35,000	JANUARY 15.—By the <i>Almirante</i> —Colombia:		
Suzette & Whitely	1,700	2,500	JANUARY 15.—By the <i>Comus</i> —New Orleans.			H. Wolff & Co.	300	
JANUARY 5.—By the <i>Comus</i> —New Orleans.			E. Steiger & Co.	27,000		Various	4,500	4,800
JANUARY 8.—By the <i>Verde</i> —Mexico.			JANUARY 8.—By the <i>Verde</i> —Mexico.			JANUARY 15.—By the <i>Almirante</i> —Colon:		
E. Steiger & Co.	1,200		E. Steiger & Co.	1,200		W. R. Grace & Co.	12,000	
Lawyer & Johnson & Co.	7,000		J. A. Medina & Co.	700		JANUARY 18.—By the <i>Eastern Prince</i> —Bahia:		
J. A. Medina & Co.	700		H. Burger & Stack	300		Adolph Hirsch & Co.	35,000	
H. Burger & Stack	300		Graham, Hinkley & Co.	200		JANUARY 18.—By the <i>Advance</i> —Colon.		
Graham, Hinkley & Co.	200		Pedro Francisco	200	9,600	W. R. Grace & Co.	33,000	
Pedro Francisco	200		JANUARY 8.—By the <i>Caracas</i> —Colombia.			M. L. Collantes	14,000	47,000
JANUARY 8.—By the <i>Caracas</i> —Colombia.			Commercial Banking Corporation	1,200		JANUARY 19.—By the <i>Colorado</i> —Montevideo.		
Commercial Banking Corporation	1,200		R. del Castillo & Co.	600	1,800	M. Rodriguez	30,000	
R. del Castillo & Co.	600		JANUARY 9.—By the <i>Caracas</i> —Colombia.			JANUARY 18.—By the <i>Advance</i> —Colon.		
JANUARY 9.—By the <i>Caracas</i> —Colombia.			G. Amsinck & Co.	5,500		G. Amsinck & Co.	2,000	
G. Amsinck & Co.	5,500		Wass's, Koldenburgh & Co.	3,500		Alcan. Trading Co.	2,100	4,700
Wass's, Koldenburgh & Co.	3,500		J. A. M. Rice & Co.	1,500		JANUARY 20.—By <i>El Norte</i> —Galveston.		
J. A. M. Rice & Co.	1,500		H. Burger & Stack	800		Various		*145,000
H. Burger & Stack	800		R. Lohr & Co.	500		JANUARY 20.—By the <i>Colorado</i> —Galveston:		
R. Lohr & Co.	500		W. R. Grace & Co.	300	1,100	Various		*33,500
W. R. Grace & Co.	300		JANUARY 11.—By the <i>Comus</i> —Bahia.			JANUARY 21.—By the <i>Santiago</i> —Mexico.		
JANUARY 11.—By the <i>Comus</i> —Bahia.			R. Schen Bros. & Co.	85,000		American Trading Co.	17,500	
R. Schen Bros. & Co.	85,000		Adolph Hirsch & Co.	45,000	33,000	G. Amsinck & Co.	4,000	
Adolph Hirsch & Co.	45,000		JANUARY 11.—By <i>El Norte</i> —Galveston.			H. Marquardt & Co.	200	21,700
JANUARY 11.—By <i>El Norte</i> —Galveston.			Various		*33,500	JANUARY 22.—By the <i>Santo Marta</i> —Colombia:		
Various		*33,500	JANUARY 11.—By the <i>Santo Marta</i> —Colombia:			A. Held	5,000	
JANUARY 4.—By <i>El Norte</i> —Galveston.			R. Schen Bros. & Co.	1,000				
Various		*2,500						

Gum, Schott, 2	1944	35,675
Port of Peki, H. S. M. Co. 2	1944	1,400
Scrap rubber, 100,000	1944	35,748
Port of Peki, H. S. M. Co. 2	1944	1,400
Rubber scrap, 100,000	1944	35,748
Port of Peki, H. S. M. Co. 2	1944	1,400
Exports:		
Port of Peki, H. S. M. Co. 2	1944	1,400
Rubber scrap, 100,000	1944	35,748
Port of Peki, H. S. M. Co. 2	1944	1,400

	Paid	By Cash	Dec. 18, 1914.	
				Value
1000 Shares	11,215	\$5,607.50	

EUROPE.

	1914	1915
January 1	57.07	54.10
February 1	60.07	60.10
March 1	71.07	70.10
April 1	73.08	70.10
May 1	73.07	9.07
June 1	71.07	9.07
July 1	67.06	9.09
August 1	67.06	8.08
September 1	7.07	8.08
October 1	71.07	83.09
November 1	78.07	8.08
December 1	7.07	7.08



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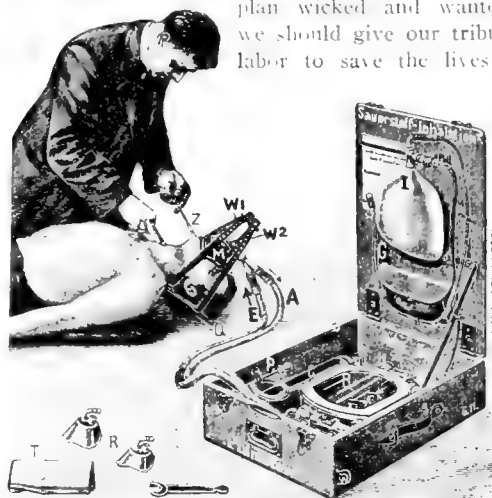
THE PULMOTOR.

SAY what we may, it is only morbid sentiment on the one hand or savage brutality on the other which will deny the supreme value of human life. Whatever consolations philosophy or religion may hold forth, it is true that the man who dies before his time has lost this beautiful world, which is his by heritage. As we ought to give our detestation to those who

plan wicked and wanton slaughter, so we should give our tribute to those who labor to save the lives of their fellow

men; and it is a relief in such times as these to consider any factor that makes for the saving rather than the destruction of human life.

An invention of this class which properly comes under the purview of this journal is the Pulmotor, which was invented



A—Rubber Exhaled Air Tube. E—Inhaling Tube. G—Armored Rubber Tube for Inhalation. I—Rubber Pneumonometer Bag. M—Rubber Face Mask. P—Rubber Extension Tube. H¹, H²—Rubber Elastic Fabric Straps. Rubber Demonstration Bag not shown.

in 1908 by Mr. Bernard Draeger, of Luebeck, Germany. As its name indicates, it is an apparatus to enforce respiration when natural breathing has ceased.

Everybody has read in "first aid" directions how to induce respiration in persons rescued from drowning, suffocating fumes, etc., but not one out of ten thousand knows what to do. Even if he does, theory is likely to fail when confronted by emergency, and anything like expert work is not to be expected. All mechanical aids before the invention of the Pulmotor had the same difficulty, in only less degree, inasmuch as they were still dependent upon the understanding, strength and coolness of the operator.

The Pulmotor, on the other hand, does its work automatically when once adjusted. No tubes are run down the victim's throat, but an airtight mask is applied to the face and air mixed with oxygen is forced under this mask with such pressure that the lungs are mechanically filled. This pressure having been reached, an exhaust movement automatically follows, the air from the lungs being discharged into the outer air. Immediately reversing, the lungs are again filled with the oxygenated air, the blood begins to be revitalized and the nervous centers which have failed of their functions once more resume the orderly processes of life. At no time is there any danger to the patient from the use of the Pulmotor, as the pressure can never go beyond a scientifically fixed limit and the filling and exhaustion of the lungs proceed with rhythmic certainty. It is unquestionably a means of saving life where all other means would fail, and it should have a place in all situations where danger from asphyxiation may reasonably be apprehended.

The New Jersey Zinc Co., New York, to meet the growing demand from paint manufacturers, manufacturers of rubber goods and others for their "Lithopone," are erecting a large plant for its manufacture, near their oxide plant at Millport, Palmerton, Pennsylvania. It will occupy a plot 400 x 600 feet, will comprise about a dozen buildings and will be ready for operation by April 1.

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Edited by HENRY C. PEARSON—Offices, No. 25 West 45th Street, NEW YORK.

Vol. LI. No. 6.

MARCH 1, 1915.

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THE INDIA RUBBER PUBLISHING CO.

No. 25 West 45th Street, New York.

CABLE ADDRESS: IRWORLD, NEW YORK.

HENRY C. PEARSON, Editor

Vol. 51.

MARCH 1, 1915.

No. 6

SUBSCRIPTIONS: \$3.00 per year, \$1.75 for six months, postpaid, for the United States and dependencies and Mexico. To the Dominion of Canada and all other countries, \$3.50 (or equivalent funds) per year, postpaid.

ADVERTISING: Rates will be made known on application.

REMITTANCES: Should always be made by bank draft or Postoffice or Express money order on New York, payable to THE INDIA RUBBER PUBLISHING COMPANY. Remittances for foreign subscriptions should be sent by International Postal Order, payable as above.

DISCONTINUANCES: Yearly orders for subscriptions and advertising are regarded as permanent, and after the first twelve months they will be discontinued only at the request of the subscriber or advertiser. Bills are rendered promptly at the beginning of each period, and thereby our patrons have due notice of continuance.

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Entered at the New York postoffice as mail matter of the second class.

TABLE OF CONTENTS ON LAST PAGE OF READING.

AN EVEN HUNDRED MILLION AMERICANS.

A GREAT deal has been written lately about the possibilities of our foreign trade. This is a timely subject and one of extreme importance, for our foreign trade should certainly receive a great impetus from present conditions abroad. In fact some financial prophets predict that the present year will see a balance of trade in our favor of \$1,000,000,000. But it might be remarked that the home market is also constantly and rapidly increasing.

The last census, that of 1910, gave the United States a population of 91,972,266, and the government experts, basing their figures on the increase shown by that census over the census of ten years before, have been trying to estimate at just what date the population would cross the 100,000,000 mark. One statistician connected with the Census Bureau believes that

the mark was crossed late in January; another places the date early in April. Taking an even course between the two—which is a wise procedure when experts disagree—it may safely be stated that the 100,000,000 mark will be reached about the first of March, or just about the time this publication is received by the greater number of its readers.

This population is equal to the combined population of the United Kingdom and France with Denmark, Norway, Sweden and Portugal thrown in; and what is more to the point as far as rubber goods are concerned, these 100,000,000 Americans have a greater buying power, even in normal times, than the combined population of the six countries named together with all the other people in Europe.

THE REFORM WAVE REACHES THE TIRE.

IN the past the tire has been the object of considerable objugation on the part of the car owner, and perhaps with some little reason. It was not so much that he objected to the price he had to pay as it was the fact that when he mentioned, with some little show of pride, that he had got a 40 per cent. discount on his tire from the little dealer down the street he found that his neighbor had secured a 45 per cent. discount on the same tire from the same dealer. These experiences are always rather humiliating.

But the last month has seen the introduction of a much-needed reform (mentioned in more detail elsewhere in this issue) in the selling of tires. Now, when the consumer goes into the tire market to get a new casing he will no longer be confronted with a highly inflated list—which will be generously deflated for his particular benefit—but he may carry with him the net lists issued by the manufacturers and know in advance just what he should pay for his tire, with the added comforting assurance that there will be no subsequent discovery that his neighbors have paid less. This is a most salutary change and will help the tire to assume the distinguished place in public esteem to which its great usefulness entitles it.

Another development of the past month gladly welcomed by the car owner was the reduction, amounting on an average to about 20 per cent., in the retail price of the tires most in demand. On comparing present prices with those that ruled four and five years ago, during the period of high crude rubber costs, it will be found that tires now offered at about \$19 then cost the consumer \$45 to \$50. In other words, there has been a reduction during the last

half decade of about 60 per cent. But this reduction is warranted by the increased efficiency of manufacturing plants, the extraordinary fall in the price of crude rubber from \$2.50 and over to the neighborhood of 60 cents per pound and the exceptionally low price at which cotton is now selling.

With good, serviceable cars selling for a very few hundred dollars, and with tire maintenance, under ordinary conditions of travel and with reasonable use, amounting, let us say, to not over \$100 a year, the happy condition has arrived where the plain citizen may become a car owner without curtailing his reasonable expenditures for food and shelter or bringing the sources of his income under suspicion.

COMBINATION FOR EXTENSION OF TRADE.

IN his interesting forty-five minute dissertation before the Chamber of Commerce of the United States early in February, President Wilson, after discussing many and varied matters, addressed himself briefly to one subject which is of vast importance to all the manufacturers of the United States, including those who manufacture rubber goods. He spoke of the great disadvantage under which American exporters are placed in seeking foreign markets in the restrictions which prevent them from combining forces, as compared with foreign exporters, who are not only encouraged but are assisted by their respective governments in cooperating to secure foreign trade.

He appeared to assume that the anti-trust laws made it illegal for any sort of combination of commercial interests whether that combination was in restraint of trade or for the purpose of extending trade. He pointed to the obvious fact that under these conditions the great manufacturing corporations which are able to extend their organization into every quarter of the globe can thus secure practically a monopoly of the export business, as the smaller manufacturer is in no position to maintain such an extended organization. He said: "The question arises, therefore, how are the smaller merchants, how are the younger and weaker corporations, going to get a foothold as against the combinations which are permitted and even encouraged by foreign governments in this very field of competition? I want to be shown how that combination can be made and conducted in a way which won't close it against the use of everybody who wants to use it." Mr. Wilson stated that he did not expect the members present to offer a feasible working plan off-

hand, but he promised if any legal and equitable form of combination could be devised for entering foreign markets he would favor it.

In this address he exposed the chief weakness in our foreign trade situation. Assuming that the President is right in his construction of the Sherman law, namely, that it forbids all combination irrespective of its purpose, it is obvious that the small manufacturer and importer must find the foreign field if not closed to them at least a difficult and expensive one to enter. Under these conditions it would seem quite urgent that the legal branch of the Executive Department should give a definite interpretation of the anti-trust laws which will ensure American commercial interests immunity if they combine for foreign trade, or else, if this is not possible, that Congress should so amend the anti-trust laws that their restrictions should apply only to those combinations which are distinctly in restraint of trade and not to those whose purpose is general trade expansion.

WAR'S PROMOTION OF LIFE-SAVING DEVICES.

WAR'S first business is slaughter; the greater the slaughter the more successful the war. But over against this truism lies the fact, as a sort of inverted corollary, that war's second concern is the preservation of life. Each combatant seeks to destroy as many of the enemy as possible while saving his own men. So, while in time of war many active brains are engaged in devising new agencies of destruction, an equal number are absorbed in the invention of means to nullify these new methods of attack.

For instance, of all the recent devices for destroying life at sea, none is so appalling in its work as the submarine. It comes upon its victim unseen, it strikes from the dark and there is no hope of escape. But since the beginning of the present great conflict, with its swift development of submarine warfare, there has been a constant effort to mitigate its work in the destruction of human life. The British Admiralty early in the war arranged to have the officers and men of its fleet equipped with a swimming collar—which was described and illustrated in the January number of this publication—and everyone on board in time of possible attack is compelled to have this collar about his neck during waking hours and inflated and at his side during sleep.

But the Germans have not lagged behind, for when

the cruiser "Blücher" was sunk in the North Sea battle in January the members of the crew leaped into the water and remained floating there until picked up by the English boats, when it was discovered that the Germans were equipped with what might be called an inflated rubber chest protector attached at the waist to a cork belt and fastened on the shoulder.

To a very large extent these simple and inexpensive rubber devices worn by the members of the English and German navies are able, if not to nullify, at least to mitigate the deadly work of the sub-sea monsters.

THE RUBBER-TIRED BUS DISTURBS THE TROLLEY.

AN official of a Los Angeles street railway company recently stated to a committee of the California legislature that it would only be a short time before the auto-bus would drive the trolley car out of business. He is not alone in entertaining this apprehension. Within a few days the mayor of Seattle has opposed a movement for municipal ownership of the street car lines on the ground that the auto-bus would soon supersede them, and the complaint comes from a number of cities, particularly in the West, that street car traffic, and consequently street car profits, have been very much reduced since the advent of the big motor-driven stages.

It is hardly likely that the motor-bus will entirely displace the trolley, for in some lines of service the trolley has great advantages, especially in inter-urban service, where the continuous runs cover a distance of several miles, and also in the smaller cities where there is no elevated road nor subway, and where the morning and night flow of the population to work and home must be taken care of quickly and in large volume. But the motor-bus undoubtedly will prove a disturbing rival to the trolley in solving certain parts of the city transportation problem. It has this great advantage that it requires neither track nor large and extensive power plant. It also can cover many sections of the city where the trolley could not be introduced profitably. It is also very convenient for the shopper, who can take it at the nearest corner and alight at the store door. And it serves the sightseer pleasantly in taking him through attractive streets where the trolley has not been permitted to enter.

And the auto-bus, with its great weight of 3 to 4 tons and its capacity for 35 to 45 passengers, representing an additional weight of 2 to 3 tons, has been rendered possible, of course, only by reason of the rubber tire.

BREATHING GOOD AIR AMID DEADLY FUMES.

THE January number of this publication contained an illustrated article on the wonderful deep-sea salvage work recently carried on at the mouth of the St. Lawrence in connection with the ill-fated "Empress of Ireland," this work being conducted at a depth of 100 feet below the surface. The apparatus used was described in detail and the fact brought out that rubber formed not only a very considerable part of its construction but was absolutely indispensable to its successful operation. Several pages of this issue are devoted to a description of the safety equipment most generally used in working in dense smoke or in noxious fumes. This equipment, though so compact and light as to be worn without discomfort across the chest, enables the wearer to continue respiration comfortably and without any subsequent ill effects, in the deadliest atmosphere. Like the diver's outfit, this equipment also depends for its efficacy on its rubber parts.

The recent accident in the New York subway, in which several hundred passengers were rendered unconscious by the fumes of burning insulation, and where one death ensued, not only has awakened the New York fire department to the urgent necessity of adding to its resources an adequate equipment for this sort of rescue work, but has called attention anew to the vital need of smoke helmets in some form wherever there is a possibility of the generation of suffocating gases in places not freely open to the air.

OUR GERMAN CONTEMPORARY'S CREDITABLE RECORD.

IN a paragraph which appeared in the January issue of this publication regarding the effect of the war on our European contemporaries it was remarked that the publication of the "Gummi-Zeitung" was interrupted only for the four August issues. It is a pleasure to state that there was in reality no interruption whatever and that, notwithstanding the disturbed conditions of the empire, this German publication, which entered the field of rubber journalism twenty-nine years ago, was able to adhere to its regular schedule. The non-arrival of the August numbers, which have since come to hand, was not attributable to any suspension of regular publication, but simply, as subsequently developed, to the temporary derangement of the German postal facilities.

The First Month of the Embargo Suspension.

WHEN it was announced, on January 8, that the British Government would suspend its embargo on the shipment of rubber from London and other British ports to New York, under guarantees from American importers and manufacturers that none of this rubber, either in crude or manufactured form, should reach the enemies of the Allies, it was at once perceived that here was a problem involving a good deal of detail in its effective operation. The matter of arranging all this detail so as to release London rubber to American purchasers as rapidly as possible has received unremitting attention during the last month and is progressing very satisfactorily.

Sir Richard Crawford, connected with the British Embassy at Washington as commercial attaché for the special purpose of adjusting any difficulties that might arise under the British embargo on rubber, wool and other articles, arrived late in January. The Embargo Committee of the Rubber Club immediately got into communication with him, and as a result he decided that the Rubber Club would be the best agency for doing the detailed work necessary in distributing English rubber to American users. The secretary of the club was able, therefore, on February 13, to send an announcement to the trade containing the following paragraph:

"Through Sir Richard Crawford, the official representative of the British Government, the rubber trade of the United States is told that the Rubber Club of America has been appointed trustee to guard the interests of the British Empire in enforcing the agreement with reference to the import and export of crude rubber and the export of manufactured rubber goods. Frankly and fairly he puts us on honor to carry out the requirements of his Government."

A RUBBER CONTROL COMMITTEE APPOINTED.

In order to take up this new work, with all the responsibilities that it entailed, the Executive Committee of the Rubber Club convened and appointed a special committee to be known as the "Rubber Control Committee," which should have full charge of this entire matter. The membership of the committee is as follows: Charles T. Wilson, of Charles T. Wilson & Co., Inc., chairman; George B. Hodgman, of the Hodgman Rubber Co., and president of the Rubber Club of America; William E. Bruyn, of L. Littlejohn & Co., and president of the Rubber Trade Association of New York; Bertram G. Work, of The B. F. Goodrich Co.; Henry Spadone, of The Gutta Percha & Rubber Manufacturing Co.; H. Stuart Hotchkiss, of the United States Rubber Co., and William J. Kelley, with Arnold & Zeiss.

THE CLUB MOVES INTO LARGER OFFICES.

In this same communication the secretary announced the removal of the club's offices from 17 Madison avenue to the Whitehall building, 17 Battery Place, where much larger and more commodious quarters, with accommodations for the additional clerical force needed, were secured, in the immediate vicinity of the rubber importing district. As it was necessary, in order that this new Control Committee could do its work in the most satisfactory way, that it should have the general approval of the trade, the secretary concluded the communication with the following appeal:

"The honor and integrity of the rubber industry of the United States is involved. If any manufacturer, importer, dealer or broker does not wish to be bound by the restrictions imposed by the British Government, he should, in fairness and justice to himself and the whole trade, declare himself to the Rubber Club of America, who in turn may disclaim any responsibility for his actions. Anyone in the trade not heard from will be

considered as in full accord with and a partner to the obligations assumed by the Rubber Club of America and the Rubber Trade Association of New York.

"The members of the Rubber Control Committee have only accepted the responsibilities of the position upon the understanding that they will have a free hand and enjoy the full confidence of the various members of the trade. We bespeak for them the hearty co-operation of everybody interested."

In the meantime, in order that the members of the trade might keep thoroughly in mind the conditions under which they could secure shipments of rubber from London, the Embargo Committee sent, on January 30, to the members of the Rubber Club of America and the Rubber Trade Association of New York a communication giving a resumé of all the conditions contained in the guarantees required by the British Government, which were printed in full on page 249 of the February issue of this publication, and consequently need not be repeated here. One point, however, was mentioned in this communication which was not covered in the original guarantee forms. It referred to plantation rubber from the Dutch East Indies. On this subject the committee said: "We would strongly advise, pending further information, that Dutch rubber be regarded exactly the same as if it was plantation rubber. Otherwise misunderstandings would almost surely arise and the shipper would perhaps suffer cancellation of his permits pending investigation."

A VERY REGRETTABLE INCIDENT.

A very unfortunate incident occurred on February 15, when it was discovered, by means of an X-ray expert connected with the British Secret Service, that some 168 bales of cotton waste delivered at pier 59 North River for shipment on the "Cretic" to Mediterranean ports, contained small rolls of white sheet rubber. The name of the shipper as it appeared on the manifest was A. B. Newman, of New York. However, the alertness and energy shown by the Control Committee of the Rubber Club in starting at once upon a thorough investigation of this matter, convinced the British officials that the club would do everything in its power to maintain the reputation of the American rubber trade for honesty and square dealing with the British Government.

FORMS TO BE USED IN THE SALE OF MANUFACTURED GOODS.

As a good many members of the trade were somewhat puzzled when selling goods to domestic purchasers, as to what procedure they should take to prevent these purchasers from shipping the goods contrary to the guarantees, the Rubber Control Committee sent a communication, on February 19, to members of the club, giving a form of preliminary letter which, with possibly a few changes, every manufacturer could send out to his customers, and also a form which could be used, either in the shape of a rubber stamp or a printed slip, to be attached to acknowledgments of orders and invoices. This has undoubtedly proved of great assistance to manufacturers who wished to live up to their obligations religiously but were in a quandary as to just how this could be done after their goods left their possession.

Another question which naturally arose under the existing conditions concerned the proper method of procedure in making a certification of guarantees. To cover this situation the Rubber Control Committee sent to the whole rubber trade of the country, including importers, dealers, brokers and manufacturers, a circular giving the regulations for fulfilling guarantees, which, because of its importance to the trade, is given on the following page in full:

REGULATIONS FOR FULFILLING GUARANTEES.

TO the Rubber Trade of the United States, including Importers, Dealers, Brokers and Manufacturers:

This is to inform you that the Rubber Control Committee has passed resolutions covering the procedure for the certification of guarantees to the British Consular office for the proof of delivery of rubber and necessary formalities in case of rejection.

I—PROCEDURE FOR CERTIFICATION OF GUARANTEES.

Manufacturers are to sign guarantees furnished them in blank. The signature must be accompanied by the corporation seal in the case of a corporation, or signed by a partner in the case of a co-partnership.

If manufacturers so desire, they may lodge such guarantees signed in blank with the importers, or they may lodge them with The Rubber Club of America, Inc., as trustee.

In case guarantees are filed with The Rubber Club of America, Inc., the secretary shall only give such guarantees to importers for their signature upon importers furnishing him with type-written particulars of marks, numbers, quantities and grades of consignments, together with the names of the steamships by which they arrived, which information shall be placed upon the guarantees before they are released for the importer's signature.

II—PROOF OF DELIVERY OF RUBBER.

Each shipper of rubber to a manufacturer or dealer, for the purpose of showing proof of shipment, shall lodge with the secretary of The Rubber Club of America, Inc., within a reasonable time (the limit being ten days) a signed copy of the bill of lading from the transportation company, or a signed copy of the delivery receipt from those receiving the rubber, with the gross weight indicated thereon.

The secretary is also to send to each manufacturer a form describing the goods covered by guarantee certified to by him. To

said form a receipt is attached, which is to be signed by the manufacturer as soon as the rubber is received, and returned to the secretary. In this way, the committee expects to keep check of the arrivals in the port of New York and verify actual deliveries to manufacturers.

III—CHARGES FOR HANDLING.

Two cents per case or package shall be charged by The Rubber Club of America, Inc., to cover the expenses incurred in handling the importations of Plantation rubber, in accordance with the requirements of the British Government and the regulations passed by the Rubber Control Committee.

Said charges became operative with the arrivals on steamer "Menominee." They are to be collected from the importers, who shall in turn collect from the manufacturers.

IV—REJECTED RUBBER: NOTICE TO SECRETARY.

The attention of manufacturers is called to the fact that they are accountable for rubber released for their account, and that in case of rejection of rubber in whole or in part the manufacturers must immediately notify the secretary of The Rubber Club of America, Inc.

In such cases, the secretary must promptly receive from the seller of the rubber either a new guarantee from a new customer for the delivery of the rejected rubber to them, or the seller must put the parcel in trust (pending the resale of same) with The Rubber Club of America, Inc.

V—HOURS OF CERTIFICATION.

The hours during which the secretary of The Rubber Club of America, Inc., is prepared to receive information from importers as to particulars of shipments, where guarantees are held in trust by him for manufacturers, or in which their guarantees can be certified, are from 10 A. M. to 4 P. M. on week days and 10 A. M. to 12 A. M. on Saturdays.



STILL UNDER OBSERVATION.

DR. J. BULL. YOU ARE MUCH BETTER, MR. RUBBER, POSSIBLY WELL, BUT BE CAUTIOUS, A RELAPSE WOULD BE SERIOUS.

AN INTERESTING INTERVIEW WITH SIR RICHARD CRAWFORD.

SIR RICHARD CRAWFORD, the special commissioner attached to the British Embassy at Washington and appointed by his government especially to supervise all matters arising under the rubber and other embargoes, arrived in New York from Washington on February 24 to devote two or three days to his duties in connection with rubber and other importations at that port. He was selected for this very responsible work because of his successful career in the diplomatic work connected with England's foreign commercial relations.

Notwithstanding the amount of work awaiting him on his arrival at New York, Sir Richard was kind enough to accord a representative of THE INDIA RUBBER WORLD an interview. He expressed himself as thoroughly satisfied with the manner in which the Rubber Club was conducting the various proceedings connected with the distribution of rubber from London to American importers and manufacturers and he was convinced that he had done wisely in arranging that the club should assist the British Consulate in this onerous work.

There were some features, of course, that would improve as the work progressed. One in particular he spoke of in some detail, namely, the unfortunate delays in clearing the docks of rubber under the present system, which permits an importer to take only such rubber as he has sold and for which he has the manufacturer's guarantee. At present, any unsold part of a shipment consigned to the importer must remain on the docks, as there are no facilities for its warehousing. Sir Richard's suggestion to the trade is that all these importations should be financed through one bank, to be approved by the British Government and which would be held responsible by that Government for the retention of all rubber released under the proper guarantees. Should this system be adopted and all rubber be financed through one banking institution with approved London connections—like the Morgan house, for instance—the importer would have any unsold part of his consignment warehoused by the bank, to be released to him as subsequent sale might be made. This would relieve the docks from congestion, expedite the discharge of cargoes and save a great deal of unnecessary routine work. He was fully aware of the fact that such a change in financing importations of rubber would meet with considerable opposition, but on the whole he believed that it would be vastly to the advantage of the trade.

When a certain paragraph in the communication sent out on January 30 by the secretary of the Club to its firm members, namely, "Sir Francis Hopwood made it particularly clear to Mr. Work that the American industry could feel secure under the present plan unless numerous violations occurred," was called to Sir Richard's attention and he was asked how numerous the British Government would permit these violations to become before taking any official notice of them, he made it clear at once that the British Government would not wait for "numerous" violations but would take note of any violations whatever and would expect the rubber trade of America to live up to the agreements that had been made, fairly and fully.

He was convinced that this was exactly what the trade wished to do and cited with satisfaction the promptness and vigor with which the Rubber Club took up the attempt by an irresponsible person to smuggle a few hundred pounds of rubber concealed in cotton bales on the "Cretic" which sailed about the middle of February. The action of the club in this matter proved that its officials were extremely jealous of the honor of the American rubber trade and sensitive to any imputation that might be placed upon it.

As a number of inquiries have been made by members of the American trade as to what would be expected of them regarding shipments to Porto Rico, the Philippines and the Hawaiian

Islands, Sir Richard was asked as to his interpretation of this matter. He replied that the stipulations contained in the guarantees fully covered this point and made it clear that, after manufacturers had signed the guarantees, they would be expected to report all such shipments to the British Consul at the port of shipment, just as in the case of shipments to non-European neutral countries not under the American flag.

Another question—rather more hypothetical in its character than of immediate practical interest—was put to Sir Richard, namely: In case the Germans should convert their "War Zone" into an effective blockade and commerce between London and New York should be interrupted, would the British Government be willing to have rubber shipped direct from the East to American ports? Of course he did not admit that any such contingency could arise, but he was free to say that should anything interrupt commerce between London and New York the British Government would undoubtedly sanction the shipment of rubber from the East to American ports either direct or by transshipment at Gibraltar.

Sir Richard expects to remain in this country for some months, passing the greater part of his time, naturally, in Washington, but running over to New York every ten days or so to take up whatever questions regarding embargo matters may need his attention.

PROPOSED CONSTITUTION AND BY-LAWS OF THE RUBBER CLUB OF AMERICA, INC.

THE recent important work done by the Rubber Club of America relating to the embargo on crude rubber has opened the eyes of the trade, and indeed of the club itself, to great possibilities for further usefulness. Now to be prepared for whatever situation may develop the Board of Directors and the Executive Committee, at a recent meeting, decided to change the constitution of the club, to give them adequate power.

The club at present operates under a Massachusetts charter, which practically allows of only social activities. It has been decided, therefore, to dissolve the Rubber Club of America and surrender the Massachusetts charter. At the same time The Rubber Club of America, Inc., will be formed under Connecticut laws. To do this it is necessary to secure the written consent of a majority of the members. By the time this reaches our readers the blanks for the consent both to this dissolution and the creation of the new corporation will be placed before the membership of the club, together with a copy of the new constitution and by-laws.

The whole plan has been worked out by the Executive Committee and the Board of Directors under expert advice, and the adoption of the new constitution will undoubtedly make the club much stronger and certainly of very much more value to the rubber trade of the United States and Canada. The salient points of the new constitution follow:

Under the new arrangement the Board of Directors, which will be nominated by the Nominating Committee,* will consist of the president, the two vice-presidents and nine other firm members, with the power to add to their number.

The Board of Directors will elect the officers, who will be a president, a vice-president, a second vice-president, a secretary and a treasurer.

The Board of Directors also appoints the Executive Committee, which will consist of the president, the two vice-presidents, the last ex-president and two firm representatives.

Ex-presidents of the association, as long as they remain members of it, will be *ex officio* members of the Board of Directors and of the Executive Committee, with the right to vote at all meetings, but not to be counted on a question of quorum.

Some of the more important articles are quoted below in full:

ARTICLE I.

Name.

The name of this association shall be THE RUBBER CLUB OF AMERICA, INC.

ARTICLE II.

Object.

The Rubber Club of America, Inc., is established to promote in all lawful ways the commercial interests of its members and to secure the advantages to be obtained by mutual co-operation; to acquire and disseminate information concerning trade conditions at home and abroad, credits and other matters of interest; to promote social intercourse among those connected with the rubber industry and commerce, and in general for the promotion of the welfare of the rubber industry.

ARTICLE III.

Membership.

Section 1. The membership shall consist of "Firm," "Associate" and "Honorary," election to be by vote of the Executive Committee.

Section 2. (a) Any firm, corporation or individual engaged in the rubber industry and commerce in the United States of America or in the Dominion of Canada may become a "Firm Member" of this association. Each "Firm Member" shall be represented by an officer of the corporation or a member of the firm, who shall be designated and registered as the "Firm Representative" except as provided in Article X hereof; no one shall be permitted to vote at the annual meeting or at any special meetings of the association except the registered Firm Representative, but this power may be delegated to some one in the employ of or acting for the "Firm Member" holding a written proxy. Only officers of a corporation or partners of a co-partnership holding "Firm Membership" are eligible to election as President, First Vice-President, Second Vice-President and Director. "Firm Members" shall alone shall have a pecuniary interest in the assets and property of the association. Each "Firm Member" shall be entitled to cast one vote.

(b) Any person connected with a corporation or firm engaged in the rubber industry and commerce in the United States of America or the Dominion of Canada shall be eligible to Associate Membership in this association. Associate members are admitted to the social privileges of the club, but shall have no voting power except with respect to the social activities of the association.

(c) Honorary Membership shall be at the discretion of the Executive Committee, but such membership shall carry no voting power.

ARTICLE IX.

Organization of Divisions.

Section 1. "Firm Members" of this organization may form themselves into divisions according to the particular branch of the rubber business in which they are respectively engaged for the purpose of acting upon such matters as pertain to their business. "Firm Members" may designate some person connected with their concern to represent them in division meetings and activities, who need not be the firm representative, but who must have from the firm member proper authority to act on its behalf.

Section 2. Each division may adopt its own rules and regulations, provided such are not inconsistent with the Constitution and By-Laws of this association. Each division may appoint its own Chairman and Vice-Chairman, but the Secretary and Treasurer of each division shall be the Secretary and Treasurer of this association.

Section 3. Special work undertaken for the exclusive benefit of a division shall be at the expense of such division. The amounts necessary to meet the cost of such special work shall be provided by each division in such manner as it may deem advisable, and such funds shall be placed by the Treasurer of the association in a "special account" to be drawn against, but only on the written approval of the Chairman or Vice-Chairman of such division.

ARTICLE XI.

Entrance Fees and Annual Dues.

Section 1. Entrance Fee. Upon the election of every member the Secretary shall notify him thereof and furnish him with a copy of the Constitution and By-Laws. Every firm member thus elected (Associate and Honorary being exempt) must within thirty days after receipt of such notice of his election pay to the Treasurer an entrance fee of twenty-five (\$25) dollars.

Section 2. Annual Dues. The annual dues for "Firm Members" shall be fifty (\$50) dollars per annum, and for "Associate Members" five (\$5) dollars per annum, payable in advance. All dues for members elected prior to the adoption of these By-

Laws shall be payable on April 1 in each year, and those who are elected subsequent to the adoption of these By-Laws shall pay their dues on the 1st of the month following their election, and annually thereafter upon the 1st day of the month in which their initial payment became due. Members who fail to pay their entrance fees, annual dues or other indebtedness within thirty days after the same become due shall be notified by the Secretary, and if payment is not made within the next succeeding thirty days shall be reported to the Executive Committee as in arrears, and may in the discretion of the Executive Committee be dropped from the membership rolls.

THE RUBBER CLUB GAINS MANY FIRM MEMBERS.

THE firm membership of the Rubber Club of America was increased by the addition of forty three new names during the month of February. The firms together with the firm representatives are given below:

American Wmmer Co., 69 Chambers street, New York; A. G. Beardsley, Jr.

Avon Sole Co., Avon, Massachusetts; Raymond F. Drake
B & R Rubber Co., North Brookfield, Massachusetts; T. G. Richards.

Baumann Rubber Co., New Haven, Connecticut; Morris Baumann.

Bay State Insulated Wire & Cable Co., Hyde Park, Massachusetts; John H. H. McNamee.

Brunswick-Balke-Collender Co., 31 W. 32nd street, New York; Charles P. Miller

Candle, L. & Co., New Haven, Connecticut; H. Stuart Hotchkiss.

Chipman, R. L., 25 Beaver street, New York (Changed from active membership.)

Dayton Rubber Manufacturing Co., Dayton, Ohio; John A. MacMillan.

Dunlop Tire & Rubber Goods Co., Limited, Toronto, Ontario; F. Westren.

General Rubber Co., 1790 Broadway, New York; William F. Bass. (Changed from active membership.)

Habirshaw Wire Co., Yonkers, New York; Richard S. Satterlee.

Henke, Gustave R., 150 Nassau street, New York
Hamilton Rubber Manufacturing Co., Trenton, New Jersey;

W. L. Blodgett.

Hadden & Co., Inc., 212 Fifth avenue, New York; H. F. Hadden, Jr.

Home Rubber Co., Trenton, New Jersey; Charles E. Stokes.

Hydes, Thomas, Trenton, New Jersey
Indiana Rubber & Insulated Wire Co., Jonesboro, Indiana;

R. W. Seiberling.
Kaufman Rubber Co., Limited, Berlin, Ontario; A. R. Kaufman.

Kokomo Rubber Co., Kokomo, Indiana; D. C. Spraker.

Knight Tire & Rubber Co., Canton, Ohio; G. F. Knight.

Lovell Manufacturing Co., Erie, Pa.; B. A. Walker.

Manhattan Rubber Manufacturing Co., Passaic, New Jersey;

A. F. Townsend.

Mishawaka Woolen Manufacturing Co., Mishawaka, Indiana;

E. A. Saunders.

Mohawk Rubber Co., Akron, Ohio; S. S. Miller.

Miller Rubber Co., Akron, Ohio; Wm. F. Pfeiffer. (Changed from active membership.)

New York Mackintosh Clothing Co., Mamaroneck, New York;

Charles H. Place

Newark Rubber Co., Newark, New Jersey; E. Pierpont Gwillim.

Polack Tyre & Rubber Co., 246 W. 59th street, New York;

Hugo Hoffstaedter.

Racine Rubber Co., Racine, Wisconsin; Louis T. Vance.

Rhoades & Co., R. W., proprietors, Rubber Stopples Co.; Long Island City, New York; Richard W. Rhoades.

Rubber Products Co., Barberton, Ohio; E. J. Schutz.

Rumsey & Greutert Co., Inc., 25 Beaver street, New York;

Henry J. Greutert.

Rubber Trading Co., 9 Murray street, New York; William T. Baird.

Spalding, A. G., & Bros., 126 Nassau street, New York; Julian W. Curtiss.

St. Mungo Manufacturing Co. of America, Newark, New Jersey; W. W. Mills.

Tayson Rubber Co., Wooster, Ohio; I. C. Emery.

Thermoid Rubber Co., Trenton, New Jersey; Robert J. Stokes.

Van Cleef Bros., 7711 Woodlawn avenue, Chicago, Illinois;

Paul Van Cleef.

Victor Rubber Co., Springfield, Ohio; H. H. Durr.
 Vulcanized Rubber Co., 251 Fourth avenue, New York; Samuel H. Dodd.
 Whitall Tatum Co., 46 Barclay street, New York; H. H. Reddy.
 Whitehead Brothers Rubber Co., Trenton, New Jersey; Alfred Whitehead.

THE MECHANICAL RUBBER GOODS MANUFACTURERS MEET.

The first general meeting of the Mechanical Rubber Goods Manufacturers' division of the Rubber Club of America was held Tuesday, February 16, at 33 West Forty-second street. Twenty-six different companies were represented at this meeting.

William T. Cole, of the Fabric Fire Hose Co., was elected permanent chairman of the division, and John J. Voorhees, president of the Voorhees Rubber Manufacturing Co., was elected vice-chairman.

It was voted that the annual meeting of the division should be held on the same day as that of the Rubber Club of America, and that regular quarterly meetings of the division should be held quarterly after the first annual meeting. The following executive committee was appointed: William T. Cole, chairman, Fabric Fire Hose Co.; George E. Hall, Boston Woven Hose & Rubber Co.; C. C. Case, Revere Rubber Co.; Henry Spadone, Gutta Percha & Rubber Manufacturing Co.; C. Edward Murray, Empire Rubber & Tire Co.; J. H. Kelly, Republic Rubber Co.; Howard E. Raymond, The B. F. Goodrich Co.; John J. Voorhees, Voorhees Rubber Manufacturing Co.; George H. Wies, Eureka Fire Hose Manufacturing Co.

RUBBER BOOTS REDUCED IN PRICE.

THE United States Rubber Co. announced its new footwear prices for the coming season on March 1 instead of as hitherto on January 1. There is no change in the price in the shoe lists, but the entire line of boots has been reduced in price on an average of from 4 to 5½ per cent. The net prices of Hip Boots and Short Boots, as they appear in the lists of the Boston Hub-Mark Brand, are given below, together with the prices of January 1, 1914, which were in force up to March 1. There is a corresponding reduction of price in Sporting and Storm King Boots.

HIP BOOTS.	Net Price.	
	Jan. 1, 1914.	March 1, 1915.
Men's Hip Duck or Warrior.....	\$4.53	\$4.28
Men's Hip Duck Trawler.....	4.89	4.63
Men's Hip Jungle (Duck Vamp).....	4.28	4.06
Men's Hip Gum Dull Finish.....	4.05	3.85
Boys' Hip Gum Dull Finish.....	3.31	3.14
SHORT BOOTS.		
Men's Short Duck or Warrior.....	3.24	3.09
Men's Short Duck Trawler.....	3.60	3.44
Men's Short Jungle (Duck Vamp).....	2.94	2.79
Boys' Short Jungle (Duck Vamp)....	2.28	2.17
Men's Knee Gum Dull Finish.....	3.14	2.99
Men's Short Gum Dull Finish.....	2.75	2.61
Boys' Short Gum Dull Finish.....	2.14	2.03
Youth's Short Gum Dull Finish.....	1.60	1.52
Men's Short Pebble Leg Bright Finish....	2.75	2.61
Boys' Short Pebble Leg Bright Finish....	2.14	2.03
Youth's Short Pebble Leg Bright Finish....	1.60	1.52
Women's Short Plain or Pebble Leg.....	1.64	1.57
Misses' Short Plain or Pebble Leg.....	1.43	1.35
Children's Short Plain or Pebble Leg.....	1.18	1.14

THE NEW RUBBER TARIFF IN CANADA.

Canada has recently put a special import tax on all rubber, crude as well as manufactured. There is a preferential tariff rate of 5 per cent. ad valorem and a general tariff rate of 7½ per cent. in addition to the rubber duties which have hitherto been in force. These new rates apply to rubber which was formerly free as well as to that which was dutiable. The prohibition of the export of rubber from Canada still continues.

A DECIDED STIR IN THE TIRE MARKET.

IF January was particularly interesting because of the lifting of the crude rubber embargo, February made its especial claim for attention by the reduction of prices in the tire market and the introduction of a long needed reform in the methods of sale.

The Goodrich company announced on the first day of the month a reduction amounting to about 20 per cent. in the tires most in demand. For instance, the plain tread 34 x 4 was reduced in price from \$24.35 to \$19.40. In addition to reducing its prices it published a net list to the consumer. This company was followed immediately by practically all the large tire making companies in the United States, the reductions as a rule being about the same as inaugurated by the Goodrich company. The Ajax, Braender, Diamond, Empire and United States announced what was practically a 20 per cent. reduction, while the Firestone, Fisk, Federal, Goodyear, Kelly-Springfield, Lee, Pennsylvania and Republic made public in the press and through their salesmen reductions in some cases over 20 per cent. and in others a little under that figure.

The reason assigned for these reduced prices, following other reductions during the past two years, is the decidedly lower cost of material. Crude rubber is now selling at the lowest point since the rubber industry assumed any importance, and, as everybody knows, there has been a glut of cotton this year, sending the price of that commodity to a low point. To be sure some people have assigned another reason, namely, that the large manufacturers felt that there were too many small competitors crowding into the field and thought it advisable to make the industry somewhat less attractive for these new arrivals, but whether that be so or not, the low cost of crude rubber and of cotton is in itself quite sufficient to account for the new prices at which tires are now being sold.

The reason assigned for publishing the lists of net prices to the consumer lies in the abuse to which the old price lists have been subject, many of these lists being marked up to a high figure so that the retailer could lure his customer by making what appeared to be extraordinary discounts, these discounts amounting in some cases to 40 and even 50 per cent. And even so, the consumer has sometimes found that, despite the liberal—one might say munificent—discount he received, he could have bought the same tire elsewhere at a lower figure. This reform in selling methods was greatly needed. The car owner can now tell exactly what he must pay for any given tire and will not be worried with the suspicion that if he had gone across the street he could have purchased his tire at still lower price.

Some of the small retail dealers are not pleased with the publicity methods of the manufacturers in giving out these new net lists and in stating their reasons for doing so. Some of the dealers think that these statements regarding padded lists are a severe reflection upon their methods, and in this they are quite right; but these methods were certainly open to grave criticism. To be sure, in a reform like this the just and the unjust often suffer together, but, irrespective of the fact that some innocent dealers have had an imputation put upon their methods which they do not deserve, the business of retailing tires as a whole was greatly in need of reform.

The result of these new lists with lowered prices will undoubtedly be a considerable increase in the number of cars purchased, for once the maintenance of a car comes within the comfortable ability of people of moderate means the army of car owners will grow so fast that the present tire capacity of the American mills, great as it is, will be fully utilized.

Immunity from Danger in Smoke and Noxious Fumes.

By Robert G. Skerrett.

ONLY a short while ago an appalling catastrophe was narrowly escaped in the subway of the Rapid Transit system of New York City. In some way, possibly through an overload or a short circuit, the insulation of the power cables gave way, and the intense heat of the electric arc consumed the rubber coating, filling the underground traffic way with smoke and suffocating fumes just at the time when the lines were crowded with the morning rush of office-bound passengers.

More by good luck than good management on the part of the railway company, only a single life was sacrificed, but scores were overcome by the stifling fumes. Fortunately, through the efforts of the fire department, assisted by some of the subway employees and a few passengers who kept their wits about them, those who had been stricken were gradually removed from the subway and carried to the air, where some revived, while others, more affected by the fumes, were taken to hospitals. In this work, a number of the firemen were rendered unconscious by the smoke, and the accident served to call forcibly to the attention of the public the inadequacy of existing relief facilities.

Since then, a rescue squad has been proposed in connection with the fire department and is in the process of organization, and these men are to be equipped with helmets and a supplemental breathing apparatus which will make it possible for them to carry on their task of life saving for an hour or more when atmospheric conditions would otherwise halt their efforts. Once more we have an example of the all-important part that rubber plays in modern safety devices. The equipment chosen for this rescue work is of foreign invention but is already extensively recognized in this country not only by the government and civic authorities but by certain of the most progressive of our industries in which danger from smoke, gas, or other harmful fumes, lurks.

There are rescue helmets of a variety of makes on the market, and all of them aim to accomplish the same end by more or less kindred methods of functioning, but probably the highest development of these life-saving auxiliaries are those produced by the famous Draeger Works of Lubeck, Germany. Only by persistence and endless experimenting in

the effort to improve has this combined helmet and supplemental breathing outfit reached its present perfection and its now rapidly widening adoption.

About twenty years ago, the founders of the company recognized the important part that compressed oxygen might play in all branches of rescue work. And they set about devising a uniform type of rescue equipment in which the motive power contained in compressed oxygen should be used to best advantage. At the same time they sought to find a compact auxiliary which would permit of the cleansing

and regenerating of the exhaled air, so that the man dependent upon the supply could breathe without restraint and receive the chemical constituents needful to sustain his powers, while the increased discharge of carbonic acid gas from his lungs should be properly taken care of during his moments of greatest muscular exertion.

The harder a man works the more he consumes body tissues and the greater is the measure of carbonic acid gas,

technically called carbon-dioxide, which that combustion induces. Accordingly, the fouler, so to speak, the exhalation from the lungs. Logically, this means that a rescue helmet in which the wearer must breathe must be so arranged that it can take care of this poisonous gas; and to do this efficiently and also economically there must be some automatic way of handling this gaseous by-product of the toiling body. Now this feature of economy has been in the past one of the most crucial phases of the problem, and the world owes a debt to the patient and exhaustive researches of Bernhard Draeger.

As far back as 1908, at the First International Rescue Congress, held at Frankfort-on-the-Main, this investigator announced that any rescue apparatus capable of meeting the heaviest demands should be able to supply 50 litres of pure air per minute and be constructed so as to furnish two litres of oxygen per minute. Besides doing this, the apparatus must be capable of absorbing 94 litres of carbon dioxide, which the average worker would exhale during a period of two hours. Prior to 1904 these values were unknown to physiological science, and their announcement was received with skepticism. Since then the professional world has come to realize the correctness of these requirements.



ENDURANCE TESTS FOR TWO SCORE MINE RESCUE OUTFITS.

To return to the feature of economy, the German physicist recognized that all of the oxygen taken into the lungs was not absorbed into the system and that a very appreciable percentage of it passed out again at the time of exhaling. His aim was to regenerate this oxygen and at the same time to make up the deficiency by drawing on a supply of compressed oxygen held in a compact metallic flask. To this end, he found that granules of caustic potash and caustic soda had the power of absorbing the carbon dioxide and water vapors coming from the lungs while leaving the life-saving oxygen contained in the exhaled breath to pass on to be used over. Just enough new oxygen from the reserve tank was then

required to furnish the needful normal called for by nature and demanded by the amount of work done by the wearer of the rescue apparatus at the time.

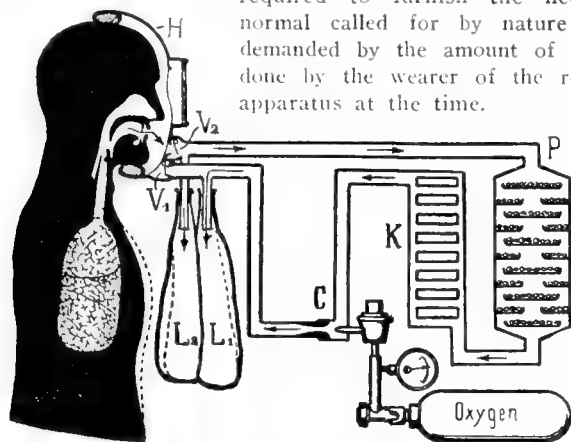


DIAGRAM SHOWING HOW THE SMOKE HELMET WORKS.

The accompanying illustration, with the following description, will enable a layman to understand the regenerative cycle of this ingenious and up-to-date life-saving equipment for service anywhere in any irrespirable atmosphere. When the apparatus is donned, the lungs and respiratory organs of the wearer are completely shut off from the external air, and form, as it were, a portion of the apparatus. In this enclosed system, into which air is no longer admitted from the outside, there are only two forces in operation for actuating the air, namely, the lungs of the wearer and the injector C, of the outfit. The injector is operated by the power of the compressed oxygen in the tank. Between these two forces are interposed the breathing bags L_2 and L_1 , as reservoirs, and at the same time acting as compensating buffers between the intermittent respiration of the human lungs and the continuously circulating air of the apparatus. The lungs actuate the air in order to nourish the body with oxygen and to expel the carbon dioxide, while the apparatus sets the air in motion for the purpose of eliminating the carbon dioxide with which it is contaminated and also to enrich it once more with fresh oxygen.

The exhaled air passes through the exhaust valve V_2 , then into the air bag L_2 , and from there it is drawn in a uniform manner. It next flows through the connecting conduit to the potash cartridge, P, where the carbon dioxide expelled from the lungs is absorbed and thus rendered harmless. At the same time, the cartridge becomes heated by the warm breath which reaches it. The air, now free from carbon dioxide, next enters the cooler, K, where a portion of the heat it has absorbed is dissipated by radiation, whence it passes on to the injector, C. Here it is revived with oxygen supplied from the oxygen cylinder at the rate of two litres (120 cubic inches) per minute. The air mixture is now once more ready to be inhaled, and flows through the second circulating pipe into the inhaling bag, L_1 , whence it is inhaled through the inhaling valve, V_1 . The cycle of operations then begins afresh.

The capacity of the apparatus is such that it is able to purify

about 3,000 litres (105 cubic feet) of air per hour, to supply about 120 litres ($4\frac{1}{2}$ cubic feet) of oxygen and absorb 50 litres ($1\frac{3}{4}$ cubic feet) of carbon dioxide. Double these quantities are dealt with in two hours. The potash cartridges and oxygen cylinder, which form the ammunition of the rescue weapon, are calculated to serve only for a certain time, and at the end of that period they must be replaced. The oxygen cylinders can be recharged, but the spent potash cartridges are as worthless as those discharged from a gun, because of the chemical changes that have taken place in the soda and potash which have absorbed moisture and carbon dioxide.

The so-called cartridges are a mechanical counterpart of the lungs, inasmuch as they are provided with a large surface for absorption. In order to insure the taking up of the carbon dioxide and vapor, a series of 20 flat metal trays is arranged upon which there are layers of caustic potash and caustic soda, in granular form, inside of the metallic casing. These trays, with their openings, are so placed that the air in following through pursues a zig-zag course, and thus is brought intimately and continuously in contact with the cleansing chemicals. In the latest form of the rescue equipment, a spent cartridge can be withdrawn and a fresh one placed in the circuit in a few seconds, and as we have said, provision is made for a continuous working period of two hours for the rescuer.

Now the man interested in rubber naturally wants to know how extensively that material enters into the vital get-up of this extremely ingenious apparatus. To begin with, the two air bags containing, respectively, the respirable and the exhaled air, are made of thick rubber of the finest sort, because their elasticity is an important characteristic, and are covered with leather pads to shield them from harm in service. The helmet would fail of its purpose if it did not fit snugly about the face of the wearer so as to shut out foul gases seeking admission back of the ears and likewise the escape of the vitalizing air. Accordingly, the apparatus has been made so that it will adapt itself to every shape of face. If the face be long or broad, large or small, the inflatable rubber pad just inside of the headpiece conforms to the shape of the wearer. This pneumatic pad is in effect much like an oval air cushion, and the degree of its inflation is regulated by the rescue worker by simply operating a rubber bulb pump. The face pad is made of the best Para rubber and in one piece, and the little hand pump is of the same fine material. Indeed, all of the rubber parts are of selected quality, because otherwise they would not measure up to their work in some atmospheres charged with certain chemical fumes.

But this is not the end of india rubber's share in the construction of this life-saving apparatus. The various flexible tubes, all gaskets or washers, ear pieces, mouthpieces, telephone insulation, etc., are of rubber.

Another form of the so-called rescue equipment, not intended for so prolonged a service, does away with the helmet and the wearer draws his air directly into his mouth by a simple tube and his eyes are protected by goggles secured in a fume-tight setting of rubber which also pinches his nose and closes his nostrils, so that he can not unwittingly or in a moment of excitement draw the foul air into his lungs. The particular virtue of this latter form is its greater compactness and the added facility with which it can be carried by a fireman and donned at the critical moment. Of course, it does not afford the same general protection to the head of the wearer nor can it



INFLATABLE RUBBER FACE PAD
AND RUBBER BULB PUMP
FOR FILLING IT WITH
AIR.

give the same length of service because its oxygen flask and its regenerative cartridges are not equal to working demands in excess of half an hour. However, there are a great many fields of usefulness for this type, and rubber is just as necessary for the inhaling and exhaling bags and the associate flexible connections.

Now, we naturally want to know how broad are the fields of usefulness for life-saving equipments of this sort. In using the term life-saving we include as well accident prevention which might otherwise result fatally. We have only to follow the monthly records of fires in large cities to realize the hazards to which the fire fighters are exposed. Day after day, we hear of one or more of these brave men perishing in the smoke for the lack of some protective equipment, while scores of their fellows are rendered unconscious. So, too, the lack of some such apparatus makes it all too often impossible for the firemen to reach others imperiled, who in consequence are numbered among the flames' victims.

From time to time we read of fires on shipboard, and it is doubtful if the average landsman realizes the peril that must be faced in battling with a burning or smoldering cargo. Fire fighting on shipboard very frequently means getting at some fairly inaccessible point in the crowded hold, and the source of danger may be a type of combustion which smokes densely rather than flames. The entire craft and all on board may be endangered unless the source of the trouble can be reached, because the spreading of the fire may touch inflammable stuffs of a fierce-burning nature or other goods that might explode by reason of excessive heat alone.

The annals of navigation are filled with stories of the risks faced barehanded, so to speak, by the crews of vessels menaced by fire. The hazards are bad enough when the ships are in port, but think of the added terrors when the craft is isolated upon the wastes of a stormy sea! No cargo is more to be feared when fire attacks it than that of cotton bales, for water seldom suffices to smother the smoldering stuff, and only by getting at the burning bales and casting them overboard can the menace be disposed of. In work of this sort, the smoke

helmet would be invaluable, and a number of these should be carried aboard every sea-going craft.

But it is not alone in fighting fire that apparatus of this sort are needful. Since the introduction of oil fuel into the navy, many times the firemen have been overcome by residual gases left in the fuel tanks after the oil has been drained away. The men have gone into the tanks to clean them and neglected to make sure that it was safe to do so. In some instances lives have been needlessly sacrificed in this fashion. Again, spontaneous combustion in the coal bunkers has filled the spaces with death-dealing fumes, and the fire fighters have fallen at their work while their rescuers have suffered as well. Quite recently an

Italian ship lost one man while four of the would-be rescuers narrowly escaped a similar fate, all because of the foul air in a water tank. Another case, that of an oil tanker, cost the lives of six men—the man that first ventured into one of the ship's exhausted tanks filled with poisonous gases and his five courageous fellows who tried in vain to rescue him. A single smoke helmet would have avoided this dire toll.

As the records of our Bureau of Mines show, the annual loss of life among the workers in our coal mines is largely made up of the deaths of volunteer rescuers who, with inadequate protective equipment, push on into the gas-laden shafts and galleries seeking to reach their stricken or imprisoned fellows. This emphasizes how vitally necessary it is that a sufficient number of smoke helmets should be ever ready at all coal mines. Fortunately, the United States Government has instituted mine rescue stations in our principal coal field districts, and the smoke helmets with which they are furnished have been the means of doing notable life-saving and salvage work. In the chemical industries and in other manufacturing enterprises where fire is a conspicuous peril or where asphyxiating fumes may develop from one cause or another, it is vitally important that supplemental breathing apparatus for rescue work should be provided. Gradually, this need is being more broadly recognized, and year by year rubber is lending its aid in this humane line of effort. The particular apparatus which we have taken as an example is recognized the world over, and today there are probably more than 8,000 of them in service. It is to this same German firm that we are indebted for the pulmotor, which has achieved such astonishing results in reviving the apparently dead. Here, too, rubber has lent its peculiar properties to the efficient functioning of this remarkable artificial substitute for the human lungs.

LIFE PRESERVERS.

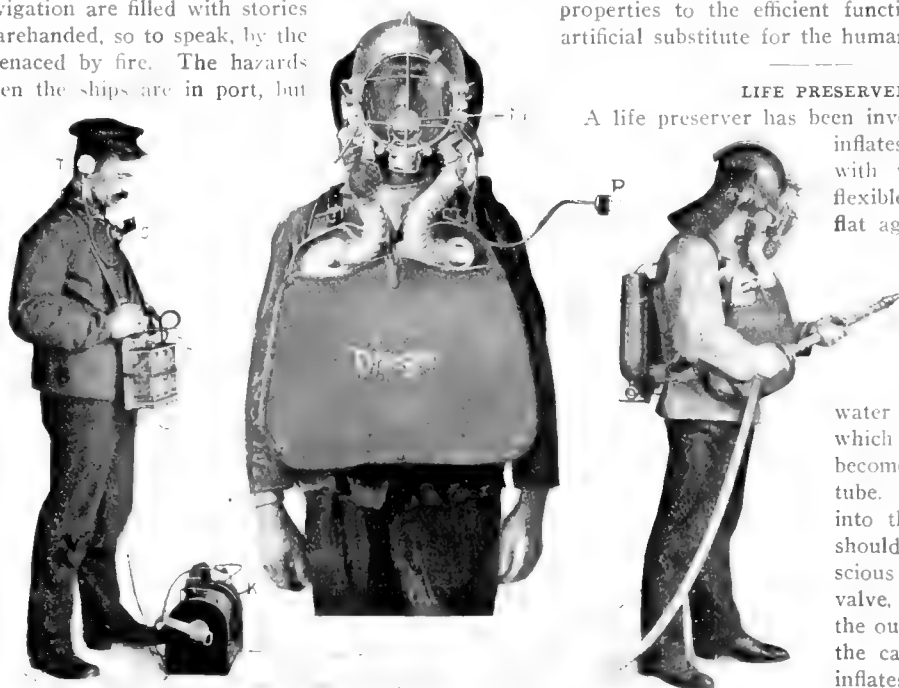
A life preserver has been invented which automatically inflates when brought in contact with water. It consists of a flexible tubular girdle which lies flat against the chest under ordinary conditions and at one end of which there are two receptacles, one containing water and the other a carbide, which when mixed with water becomes a gas that inflates the tube. A valve lets the water into the carbide receptacle, but should the wearer be unconscious and unable to operate the valve, a wick that extends from the outside draws the water into the carbide receptacle and thus inflates the tube, provision being made to prevent over-inflation.

Another new style of life preserver is the one with which

German sailors have been provided since the outbreak of the war. This device has a cork belt and a rubber vest which can be inflated in a moment, the air feed pipe when in use coming opposite the mouth. This vest is 24 inches long and 10 inches wide.

Branch managers of the United States Tire Co. from all over the United States gathered in Detroit the second week in February for a conference. E. S. Williams, president of the company, attended this conference, which lasted for several days.

Replete with information for rubber manufacturers—Mr Pearson's "Crude Rubber and Compounding Ingredients."



B—Dry cell.
K—Reel.

M—Telephone transmitter.
P—Telephone circuit plug.
S—Telephone transmitter for attendant.

S—Battery connection.
T—Telephone receiver.

A Review of Recent Progress in Rubber Chemistry—II.

Contributed.

The author of this paper, a well known rubber chemist, submitted it, not as in any way a descriptive article, but merely as an index of progress during the last two years. To elaborate it and make it a readable article would necessitate the use of many hundreds of pages.

COAGULATION

W. PAHL (Chimie Industrie, 1913, p. 142) has patented the use of carbonic acid, hydrochloric acid, etc., for coagulating, and Heinrich Coloseus (THE INDIA RUBBER WORLD, January, 1915, p. 197) has received a Brazilian patent for coagulating latex by use of alkalies followed by use of iron or similar heavy metal salts. L. C. Davidson uses soap, oils and formaldehyde, and also creosote, for coagulating latex (THE INDIA RUBBER WORLD, December, 1914, p. 130).

In German patent No. 260,916, H. Klopstock claims the use of a compound of selenium or tellurium with a halogen for vulcanizing. Rape oil thus treated is said to form a taccine. This is evidently a cold vulcanization.

IMPROVING RUBBER BY TREATING THE RAW PRODUCT.

Several attempts have been made lately to improve the lower grades of rubber by treating the product in various ways with chemicals before vulcanization. D. Spence in United States patent No. 1,112,938, assigned to the Diamond Rubber Co., has claimed the use of metallic sodium or alkaline salts for improving low grade or synthetic rubbers. (THE INDIA RUBBER WORLD, November, 1914, p. 67.) H. O. Chute has received United States patent No. 1,051,987 for process of treating rubber which claims the maceration of crude rubber with pyroligneous acid containing the oily products of wood distillation. The object is to creosote the rubber, as is done by the Brazilian system of smoking.

J. E. Ephraim, in German patent No. 273,774, adds a little sulphur and vulcanizes slightly. He may also add a little nitrogenous substance.

A. Heim, in British Patent No. 18,506 of 1912 (THE INDIA RUBBER WORLD, February, 1914, p. 224), uses methyl acetate to dissolve out depolymerized rubber from that which is polymerized. Debaugé, in French Patent No. 424,457, purifies rubber by dissolving it and precipitating the caoutchouc.

Heineman (German patent No. 276,678) claims a process of separating sterling caoutchouc from depolymerized caoutchouc, in synthetic rubber.

VULCANIZING.

Axelrod had announced that continued milling affects the affinity of rubber for sulphur. Spence and Ward ("Chemische Industrie," Vol. 11, p. 274) show that milling does not affect the affinity for sulphur, for by taking two samples and milling one for one and one-half hours, while the other was lightly worked, the amount of combined sulphur was the same in both after like treatment in the cure, but the physical properties of the two samples were different, as the long-milled sample was much weaker. These authors have described ("Chemical Abstracts," April, 1913, p. 271) an experimental vulcanizer by means of which exact experimental conditions can be obtained. These same authors (THE INDIA RUBBER WORLD, April, 1913, p. 340) have written on the chemistry of rubber and theory of vulcanization.

F. Ahrens (THE INDIA RUBBER WORLD, October, 1914, p. 18) claims that vulcanization is a reversible reaction and proves it by analyzing an old sample which contained less combined sulphur than it did when new.

In the report of Gross Lichterfelde (THE INDIA RUBBER WORLD, February, 1914, p. 267) Hinrichsen and Kindscher contributed

their theory of vulcanization. In cold vulcanization they find that $C_{10}H_{16}S_2Cl_2$ is the final product ("Journal of the Society of Chemical Industry," 1913, p. 544).

A. O. Bourne experimented ("India Rubber Journal," 1913, p. 120) on vulcanizing and testing the product physically, and deduced laws for increase of temperature and time as applied to vulcanization. No chemical tests were made to confirm this.

O. Kausch ("Kunststoffe," No. 18, 1912, p. 363) has compiled a list of all British patents on vulcanization, granted before 1912.

Hinrichsen ("Journal of the Society of Chemical Industry," p. 544, 1913) found that the limits of sulphur which could be combined with rubber in a cumene solution were at about 32 per cent.

SULPHUR IN VULCANIZATION.

The role that sulphur plays in vulcanization has lately been a matter of some dispute. It is well known that sulphur combines with rubber in widely varying amounts, ranging from $\frac{1}{2}$ per cent. as reported by Heilbronner in cements vulcanized by the ultra-violet rays (THE INDIA RUBBER WORLD, December, 1914, p. 130, to 32 per cent., as long ago announced by C. O. Weber), shown by Hinrichsen and just referred to. In each case it appears that perfect vulcanization has taken place if vulcanization be defined as that change in rubber which gives it useful qualities, though the vulcanized rubbers are not vulcanized to the same degree, and differ widely in their physical characteristics.

H. Loewen ("Zeitschrift Analytischer Chemie," Vol. 25, p. 1553) has reviewed the material on which Ostwald based his absorption theory for sulphur in rubber. He thinks the fact that rubber forms a whole series of vulcanized products, the end members of which are not definite chemical compounds, is just as strong an argument for the chemical as for the absorption theory of vulcanization. In his opinion Ostwald overlooked the fact that in forming bromine and nitrosite derivatives sulphur goes to the derivative, *i. e.*, is chemically bound to the molecule. E. Stein ("Gummi Zeitung," Vol. 27, p. 623) criticizes the above and believes the solution method is the only one by which to study the phenomena of vulcanization, Loewen (*Ibid.*) takes exception to the above and Stern replies. Spence ("Gummi Zeitung," Vol. 27, p. 1646) also criticizes Loewen's paper and his interpretation of facts.

Later ("Gummi Zeitung," Vol. 27, p. 1301, and INDIA RUBBER WORLD, December, 1913) Loewen experimented by observing rubber and sulphur under a microscope while heated to a vulcanizing temperature, and when cooling he found that the rubber formed a clear solution with sulphur when hot, and on cooling the sulphur separated out in globules, changing to crystalline sulphur on further cooling. This, he thinks, proves that sulphur is not dissolved in the colloidal state. He thinks the absorption theory of vulcanization should be dropped.

H. Skellon (INDIA RUBBER WORLD, December, 1913) experimented on the migration of sulphur by placing a sheet of rubber containing 40 per cent. sulphur over one without sulphur and then submitting them to vulcanizing temperature. He found that the sheet free from sulphur had absorbed and combined with about 10 per cent. sulphur. ("Kolloid Zeitschrift," 1914, p. 96.) He deduces from this experiment ("India Rubber Journal," 1913, p. 723) that sulphur is soluble in polyprene sulphide, $C_{10}H_{16}S_2$. F. Kirchoff ("Kolloid Zeitschrift," 1914, p. 35) thinks sulphur is only a catalyzer. Hinrichsen ("Journal

of the Society of Chemical Industry," 1913, p. 544) has discussed the action of sulphur and sulphur chloride in vulcanization. It has recently been shown that the United States is the greatest producer of sulphur in the world. (THE INDIA RUBBER WORLD, August, p. 536.)

ACCELERATORS OF VULCANIZATION.

For a long time it has been known that certain fillers or metallic compounds accelerated vulcanization and improved the rubber. Lead oxide or litharge is probably the best known. Antimony sulphide and magnesia are also known to hasten the vulcanizing and have been largely used, and lime is known to perform the same function to some extent. This action of one substance in hastening the reaction between two others when the hastener remains in the same form after the reaction as before, is called catalytic action. It is common to ascribe many reactions which are not understood to catalytic action but it is well known in many arts that there is such a phenomenon.

We recently (THE INDIA RUBBER WORLD, September, 1914, p. 650) treated the subject of the influence of nitrogen compounds on vulcanization rather fully, gathering together various scattered references on this subject. That this subject has only lately attracted the attention of writers on rubber chemistry is seen from the fact that at the Eighth International Congress of Applied Chemistry, held in New York in the fall of 1912, it was not mentioned, while, as before noted, the influence of resins on vulcanization was discussed by L. E. Weber, C. Beadle and Stevens; and G. H. Savage, E. Marckwald, F. H. Hinrichsen, J. G. Fol, C. P. Fox and Whitty also contributed to the rubber section, moreover such well-known savants as Carl Duisberg, Sir William Ramsey and W. H. Perkins were present.

At this congress no one brought up the subject of the influence of the pectous portions, the proteins or the insoluble constituents on vulcanization, but it appears that Messrs. Beadle and Stevens had, a short time previously, contributed an article on the influence of the nitrogenous and resinous constituents on vulcanization ("Kolloid Zeitschrift," July, 1912, p. 61). Since that time articles on this subject from these authors have been rather widely published, though there seems to have been but two sets of experiments ("Kolloid Zeitschrift," 1913, p. 64; "Journal of the Society of Chemical Industry," December, 1913; "Chemical Abstracts," 1913, p. 270; "Kolloid Zeitschrift," Vol. 14, 1914, p. 91; "Kunststoffe," Vol. 4, 1914, p. 255; "India Rubber Journal," Vol. 47, p. 403; THE INDIA RUBBER WORLD, May, 1914, "Journal of the Society of Chemical Industry," 1914, p. 268). W. A. Caspari ("Journal of the Society of Chemical Industry," Vol. 23, pp. 1041-3, THE INDIA RUBBER WORLD, April, 1914, p. 340) reported on the composite nature of rubber finding the pectous portions stronger. The fact that the nitrogenous portions of the rubber exerted an influence on vulcanization led to an inquiry as to the influence of added nitrogenous matters of various kinds, Messrs. Beadle and Stevens in the article above referred to, tried casein, and found it increased speed of vulcanization but did not increase tensile strength, etc. Fred. Arnt (THE INDIA RUBBER WORLD, July, 1914) pointed out that albumen increased speed of vulcanization, and the "Gummi Zeitung" (No. 28, p. 371), in an anonymous article took the same position. W. Esch received German patent No. 273,482 of November, 1912, for the use of albumen in rubber. The method is to make a paste with lime and add it to the rubber; then add some kind of tanning material or smoke it. The hastening influence does not seem to be here considered the principal consideration. Recently a hastener has appeared on the English market, but its composition is not given. (THE INDIA RUBBER WORLD, December, 1914). Vanadium is also claimed as an accelerator. (THE INDIA RUBBER WORLD, August, 1914, p. 601.) Marckwald ("India Rubber Journal," November 22, 1913) found that magnesia was a hastener. Dannerth (THE INDIA RUBBER WORLD, November, 1914, p. 75) mentioned other accelerators.

VULCANIZING WITH THE ULTRA-VIOLET RAYS.

G. Bernstein and Heilbronner (THE INDIA RUBBER WORLD, November, p. 24, and December, 1914, p. 130) recently devoted much attention to the action of ultra-violet light in vulcanization and have proposed that solutions be thus vulcanized and then used for cements.

Bernstein received British patent No. 17,195 of 1914 for this process.

V. Thomas received French patent No. 460,780 of July, 1913, but under the international convention taking the date of July 26, 1912. This relates to the vulcanization of films of rubber solution by the ultra-violet ray.

E. Stern ("Gummi Zeitung," 1913, p. 1340) has referred to this idea, and Dastre presented a paper before the French Academy of Science reviewing Bernstein's work. Victor Henry first gave accounts of vulcanizing by this method several years ago.

DECAY, TACKINESS AND DEPOLYMERIZATION.

The subject of the perishing and decay of rubber has attracted some attention of late. J. G. Fol and N. L. Sohngen ("Chemical Abstracts," 1914, p. 2958) have determined that air-dried rubber cannot support micro-organisms. Spots of various colors produced by bacteria sometimes appear without changing the mechanical consistency of the rubber. They could not find an enzyme which would break down rubber. G. S. Whitby reported on this at the Eighth International Congress of Chemistry in New York, in 1912 (Vol. 9 reports). He thinks decay due to enzymes.

A. G. Rossem ("Le Caoutchouc & la Gutta Percha," February 15, 1913, p. 6981) attacks Gorter's theory that tackiness is caused by auto-oxidation. He thinks it due to light, not infection. Kirchof (THE INDIA RUBBER WORLD, February, 1914) has discussed oxidation of rubber, but Heubener disputes his statements. G. Bernstein ("Chemical Abstracts," 1913, p. 3548) has also given views on oxidation.

F. Kirchof ("Kolloid Zeitschrift," 1914, p. 35) shows that vulcanized rubber behaves differently from raw rubber when oxidized with oxygen gas. Only one double linkage seems present in vulcanized rubber. G. Heubener (THE INDIA RUBBER WORLD, February, 1914, p. 224) criticizes the above article by Kirchof on oxidation. F. Ahrens ("Kunststoffe," vol. 3, p. 478) describes oxidation. Spence and Young ("Kolloid Zeitschrift," 1913, p. 871) have described methods for oxidation electrically. It is claimed that this method was first proposed in "Gazzett Chimica Italiana," 1907, p. 426.

ACTION OF CARBONIC ACID ON RUBBER.

F. Steinitzer experimented with the action of carbonic acid gas on rubber membranes ("Gummi Zeitung," 1912, p. 1625). He found that the absorption of the gas may vary 25 per cent. with different rubbers. Pure rubber becomes tacky on absorption of the gas, and the tensile strength decreases. P. Phillips found that rubber gaskets were excellent with carbonic acid gas containers, as they swelled and became tight. Ditmar and Thiesen ("Kolloid Zeitschrift," 1912, Vol. 11, p. 77) examined changes in fillers. They found that these changed to sulphides and sulphates in many cases.

DYEING RUBBER.

Ditmar (THE INDIA RUBBER WORLD, February, 1914) has shown that vat dyes may be mixed with raw rubber and vulcanized without change of colors. Two patents have recently appeared covering this process. (THE INDIA RUBBER WORLD, November, 1914, p. 67.)

(To be concluded.)

The United States Rubber Reclaiming Co. will rebuild the section of its plant at Buffalo, New York, which recently suffered \$75,000 fire damage.

What the Rubber Chemists Are Doing.

AS recent proposals have been made to vulcanize with selenium and tellurium, it may be of interest to give the figures of production in the United States which appear in a report of the United States Geological Survey, by F. L. Hess (Part I, p. 289). This statement is made—"During the year 1913 selenium was produced from the anode muds in electrolytic refining of copper by the American Smelting & Refining Co., the Nichols Copper Works and the Raritan Copper Works. The production amounted to 29,097 pounds, valued at about \$46,900. The production of selenium is governed entirely by the demand. Other selenium resources are sufficient to meet largely increased demands if they arise. The Raritan company also produced small quantities of tellurium which were sent to Europe."

From the foregoing it is evident that it must be demonstrated that selenium produces a vulcanized product much superior to sulphur before there can be any development of the industry; but if there is a demand the supply can be found, and if a large demand should spring up the price would undoubtedly fall, as a large amount is now wasted because of lack of demand.

PRESERVING RUBBER.

A. A. Wright has been granted United States patent No. 1,114,044 which claims to preserve rubber by coating the surface with camphor gum dissolved in alcohol and mixed with pulverized pumice.

HEATING TIRE REPAIR VULCANIZERS BY CHEMICAL MEANS.

British patent No. 4,313, of 1914, has been granted to W. A. Miles for an apparatus for vulcanizing tires in repairing, the heating being done by burning blocks of deflagrating substances, such, for example, as a mixture of saltpetre and charcoal or chlorate of potash and wood dust. This is put in the form of a ball or pile on a plate in contact with the tire and then ignited. The heat developed by the combustion is supposed to be regulated so as to be just sufficient to vulcanize the raw rubber in the repair patch.

COAGULATING.

C. H. Boehringer Sohn, in German patent No. 275,716, claims the lactate of aluminum as a coagulant, stating that 250 C. C. of a 5 per cent. solution will coagulate 3,000 grams of sap in 8 minutes.

F. A. Byrne has received British patents Nos. 18,060, 18,061 and 18,062, of 1912 (Illustrated Official Gazette, December 2, 1914) for a process of coagulating latex. It consists in smoking with vapors of: First, creosote; second, formaldehyde; third, sulphurous acid gas. These may be mixed with pyroligneous products. It really appears to be an ordinary smoking process with the above vapors added as desired.

CONDENSATION PRODUCT.

Emil Hemming, in United States patent No. 1,125,906, claims the process of hardening a condensation product outside a mold in which these products of formaldehyde and phenol are shaped.

R. C. Fulton, in British patent No. 9,066, of 1914, claims the spraying of an aldehyde or ketone into the latex while coagulating. From 3 to 5 per cent. of protein is said to be precipitated with the rubber by this treatment and this protein improves the rubber.

SYNTHETIC RUBBER FROM BAKU PETROLEUM.

The fraction of Baku petroleum boiling between 98 degrees and 106 degrees Centigrade yields about 20 per cent. of adipic acid which, through its amide, may be converted into butadiene, though the process is said to be scarcely commercial as yet. (See "Petroleum," 1914, p. 1376). This may open up a field for our California petroleum and make us independent of the embargo.

THE STUDY OF COLLOID CHEMISTRY.

F. Svedburg has addressed the German Chemical Society on the subject of colloid chemistry and at the end of extended remarks he predicts a great extension of this study in the rubber industry.

RECLAIMING OF RUBBER SOLVENTS.

Henry Barthelmy has written on this subject at length in "Le Caoutchouc et la Gutta Percha" for October, 1914, and following months. There is a long review of the art as applied to nitro-cellulose industries and there are long tables of the vapor tensions of various solvents at different temperatures and pressures.

The reclaiming methods are classified as follows:

First, the chemical processes; second, the physico-chemical processes; third, the essentially physical processes. As an example of the first process is cited the dissolving of alcohol and ether in sulphuric acid for the later formation of ether from them. Likewise carbon bi-sulphite is treated with potash and alcohol for the formation of xanthate of potash, which is then recovered. Toluol is acted on by nitric acid to form nitro-toluol, which is thus reclaimed.

The physico-chemical processes are illustrated by the absorption in a colloil, as, for example, Marseilles soap or nitro-cellulose or the use of calcium chloride or amyl alcohol for solution of the volatile solvents.

Condensation of solvent or precipitation or electrical precipitation illustrates the purely physical processes. The condensation may be under pressure as advocated by the liquid air company. It must be observed that compared with the simple and effective condensation and distillation processes in use in the country for reclaiming solvents these processes seem unnecessarily complex and expensive to operate besides requiring highly skilled operatives to work them.

ANOTHER VIEW OF BISULPHITES IN COAGULATING.

In France it is reported that experiments have proved that the treatment of latex with 0.25 per cent. of bi-sulphite of sodium may diminish the elasticity 20 per cent. and the resistance 15 per cent. At the same time it increases the necessary time of vulcanization. Reference to THE INDIA RUBBER WORLD of August, 1913, p. 222, December, 1913, p. 157, and November, 1914, p. 68, shows by the reports and experience of Beadle and Stevens that rubber, if anything, is improved by this treatment, and it is recommended.

THE SELF-REGISTERING DYNAMOMETER.

In this paper of November 1, 1914, p. 108, was an account of the self-registering dynamometer of Cheneveau and Heim. In "Le Caoutchouc et la Gutta Percha" of December 15, 1914, there is quite a controversy between A. Dubosc and the inventor as to its merits and as to the methods of calculating its functions. A. E. Davis has made use of these formulas in an article in the "Journal of Industrial and Chemical Engineering" for December, 1914. He used the Swartz apparatus for determining hysteresis but he recommends the use of the formulas as a basis of specifications for rubber goods.

The plant at Lawrenceville, Illinois, formerly owned by the American Asphalt & Rubber Co., and purchased about a year ago at receiver's sale by the Canadian Mineral Rubber Co., of Montreal, Quebec, is soon to be reopened, with a force of about 100 operatives, turning out mineral rubber.

The accepted authority on South American rubber—"The Rubber Country of the Amazon," by Henry C. Pearson.

AN EXCESS OF TECHNICALITIES IN SPECIFICATIONS.

TO the Editor of THE INDIA RUBBER WORLD:

In your February issue, page 256, I note an item signed "Chemist" and entitled "Too Much Analytical Chemistry," which is read with considerable interest. Having long been of the same opinion, and realizing the impossibility of manufacturing to strict laboratory specifications, it is gratifying to learn that a prominent chemist has finally concluded there can be an excess of technicalities in specifications.

Some time ago a Western city desired to purchase a quantity of fire hose, to be manufactured under very elaborate specifications, prepared by a coterie of chemists, in which specifications a certain acetone, a certain chloroform and a certain alcohol potash extract were demanded, the lining, or tube, to contain not less than 45 per cent. of the finest Para. A maximum amount of ash was provided for, and sulphur contents were given a limitation as to the percentage permitted.

In addition to all this, a variety of mechanical tests was also provided for, some of which were possible, while others were practically impossible; but insult was added to injury by demanding that finished product produced under these instructions be guaranteed for a period of four years, and that if at the end of the four-year period each and every 50-foot length could not withstand a rather severe pressure test, the manufacturer would replace, free of charge, such hose as might have failed.

These specifications were mailed broadcast to the manufacturers of fire hose, attached to an invitation to bid, with the result of just one bid being received, and that at \$1.20 per foot. Wondering why so few responded, the writer was consulted, who, after reading the specifications, candidly informed the officials that no manufacturer could intelligently bid on such specifications.

This conference resulted in a request to the writer to draw up specifications from his standpoint, which he did, confining them entirely to strict mechanical tests, such as elasticity, permanent set, tensile strength, friction, elongation, expansion, writhing and similar items, closing with a guarantee to cover a reasonable period of time, making allowance to the manufacturer for service rendered if defective hose had been in use one or more years.

These revised specifications were sent out to the same concerns previously solicited, resulting in almost universal bidding, the highest being about 80 cents, with the lowest, best and accepted bid naming less than 65 cents per foot—which bid, by the way, was from one of the largest, strongest and best-equipped of the American companies. These delivered upon this contract was stronger and more reliable than could have been possible with the previous laboratory specifications.

The chemist is a valuable citizen, and highly useful in his place, but that place is not to dictate to the experienced rubber manufacturer not only how he shall make his product but of what he shall make it; and then be asked to guarantee the result and pocket the loss if perchance he could not meet some other chemist's individual analysis that did not happen to come quite up to the ideal specifications as to chemical contents demanded.

W. G. BROWN.

The new catalog of the Hodgman Rubber Co., relating to rubber sundries and specialties, is exceedingly well done, not only from a typographical standpoint, but from that of the complete and well arranged information giver. In some 90 pages, generously illustrated in colors, the whole story of the Hodgman products in the lines mentioned is adequately covered. The brochure is given an added interest by some excellent halftones showing work rooms in the Tuckahoe factory of the company.

DR. HINRICHSSEN'S CONTRIBUTION TO RUBBER CHEMISTRY.

The obituary page of the February number of THE INDIA RUBBER WORLD contained an announcement of the very sad death of Dr. F. W. Hinrichsen, the noted German chemist, on the battlefield before Lodz in December while he was serving as second lieutenant in a Saxon reserve regiment. Notwithstanding his comparative youth, being only 38 years of age at the time of his death, he had made a number of notable contributions to the lit-



DR. F. W. HINRICHSSEN.

erature of rubber chemistry. After graduating from Heidelberg in 1899 he taught chemistry in the technical high schools of Aix-la-Chapelle and Charlottenburg. He entered the Royal Material Testing Bureau (Bureau of Standards), as general chemist, in 1906, devoting particular attention to the solution of rubber problems. He contributed to the leading technical publications of Germany a great number of articles on the chemistry of rubber. His communications on "Molecular Sizes in Rubber Latex" (Mitteilungen, 1911), "Rubber Resin" (Zeitschrift für Angewandte Chemie, 1910), "Cold and Hot Vulcanization" (Kolloid-Zeitschrift, Chemiker-Zeitung) are considered as authorities. His book on "Rubber and Its Tests" (Leipzig, 1910) was highly commended by the leading rubber publications of the world.

THE ALEMBIC BRAND OF SYNTHETIC RUBBER.

The February issue of this publication contained a reference to the new "Alembic" rubber which is being manufactured on a small scale in Perth Amboy, New Jersey, by the Alembic Process Co. A correspondent interested in rubber matters generally writes us as follows regarding this new brand of synthetic rubber:

"I spent three days last month at the factory in Perth Amboy and made a complete 'run' of rubber. Inasmuch as I bought the materials myself and watched the operation very carefully during the entire process, I know that it contained no natural rubber. We vulcanized a sample of the 'run' that I made, and a practical rubber man pronounced the result 'good.' This sample was vulcanized in the presence of several experienced rubber men."

The Automobile Show opens in Boston, March 6, and will continue until the 13th. The Braender Rubber & Tire Co., of Rutherford, New Jersey, will be one of the exhibitors at this show, displaying a full line of tires and tubes, having space No. 605, department G.

The Editor's Book Table.

THE RUBBER INDUSTRY. OFFICIAL REPORT OF FOURTH INTERNATIONAL Rubber Congress, London, 1914. Edited by Joseph Torrey, Ph.D., and A. Stames Manders, London. The International Rubber and Allied Trades Exhibition, Ltd. [8vo, 516 pages. Price 15s. 6d.]

THIS volume contains not only the proceedings of the London Congress of 1914 and the papers and discussions of that meeting, but also the principal papers read at the New York Congress in 1912. There is also a comprehensive introduction by Dr. D. Spence. Those who are in the habit of skipping introductions in works of this character will do well to revise their practice in the present instance. It is a carefully written, well-balanced paper admirably suited as an introduction to the more specialized articles which form the bulk of the work. A revised synoptical table of all the rubber now or recently on the market is added to this introduction.

While, of course, it is impossible to treat of all the interesting papers read at the Congress, the first is one that may by no means be passed over. This is "The Systematic Study of Rubber Production," by R. N. Lyne, Director of Agriculture in Ceylon. This is an exposition of and argument for systematic and continued study of the factors which lead to the production of more rubber, better rubber and more economically produced rubber. Only by means of association, whether official or non-official, is it possible for men to go ahead acquiring little by little the knowledge which eliminates waste and loss. The conscientious scientist at the experiment station can make experiments to determine evil practices as well as good, and the truth he learns is not a narrowly held secret to put himself ahead of his neighbor, but is disseminated for the benefit of all who are able and willing to learn. Mr. Lyne made a special plea for such co-operation as should lead to standardization of the product. It is hardly necessary to say that a standardization by which a manufacturer, without leaving his desk, could write a three-line order for as many tons of rubber as he wanted and know exactly what he was getting would mean a saving of expense and a peace of soul that could hardly be overestimated.

In the discussion which followed, Dr. Lock made a suggestion, which was cordially accepted by Mr. Lyne, that while in every station the bulk of the work should be on systematic lines, rigidly maintained, a little corner should be maintained for what Dickens used to call "Fool's Experiments"—that is, liberty to try something based upon the experimenter's lucky or unlucky guesses. Mostly they will be failures, but the experimenter will be better satisfied and now and then an unexpected result will prove a short cut to valuable knowledge.

A fact interesting in more ways than one was brought out in the paper on "Rubber Plantations of Angola," by Prof. C. de Mello Giraldes. Angola, it should be said, is a little country about twice as big as Texas—or having four times the area of Great Britain and Ireland. It is situated on the west coast of Africa, and is a dependency of Portugal. Four years ago there was a considerable trade in wild rubber gathered in the usual wasteful and destructive Native African way. There were no rubber plantations save those of a small and experimental sort. Two years later more than three and a half millions of trees had been planted and the rubber possibilities of this great district were being vigorously and intelligently developed. While *Manihot* is grown chiefly, experiments are being made with *Hevea*, *Ficus*, *Castilloa* and *Funtumia*. The *Manihot* planters have the collection made early in the morning, and in this way are able to avoid the waste of having the latex dry on the trees. Such small amounts of plantation *Manihot* from Angola as have yet come to market have sold at a price not far

behind that of the best plantation rubber of the East. Several morals may be drawn.

An interesting paper by Andre Cremazy on rubber planting in French Cochinchina brought out the fact that more than four million *Hevea* trees are now in the ground and that the soil and climatic conditions are generally more favorable than has been supposed. He says, however, that the planters are making their calculations in the serene conviction that the price will never fall below five francs per kilogram. As those of Ceylon and Malaya look forward to an ultimate price little more than half that, somebody is going to be disappointed.

An exhaustive paper on "Best Methods of Tapping," by W. F. de Bois Maclaren, is a calm presentation of facts which lead to the conclusion that the industry as a whole is injured by the eagerness of some planters to get every possible ounce of latex which their trees will afford. The author believes that it would be well if a general agreement could be made which would prevent the tapping of trees at an age which restrains their growth. He thinks that two feet girth is little enough. Tappings, he thinks, should not consist of more than two cuts daily and on only one side of the tree. He has an open mind but is not yet inclined to the belief that once-a-week tapping may finally become the rule. Sharp watch should be kept on the laborers to prevent a wasteful and damaging extension of the wounded bark area.

Mr. Guy Barr, of the National Physical Laboratory of England, read a paper on fabrics. He begins by showing that the leakage of hydrogen through rubberized fabrics is thirty times as great as through the best oiled silk and that the latter is much lighter than rubber. On the other hand rubber fabrics are more pliable and may be made to possess much greater strength.

How to secure protection from the sun's actinic rays; how to prevent moisture from adhering and adding to the balloon's weight, and how to prevent the development of electricity during rapid passage through the air, are some of the problems which are not likely to occur to the man in the street but which must be solved.

Two papers by Prof. Edmond Leplae, of Louvain University, and Director General of Agriculture, have a singular extrinsic interest. The original papers read at the conference were sent to Belgium for revision and lost in the great catastrophe of the war. The published papers were written briefly from memory by Prof. Leplae. One is on the cultivation of *Funtumia elastica*. The objection based on its branching habit, he said, could be eliminated by close planting and thinning. The yield is less than with *Hevea*, but this is being improved and the labor costs much less as the tapping is done, not daily, but two or three times a year. The quality of the rubber is very good. The other paper dealt with the problem of soil determination. Chemical analysis, he said, was always available, but it is an expensive method and frequently it happens that it leaves us little better off than we were before, because while we may know that the soil contains certain proportions of various elements, we do not know whether it is what we want for a specific crop. An inexpensive alternative is to put some of the soil from the field in a number of flower-pots and add a carefully calculated amount of manure of different kinds to different pots. The pots are then sown with oats or corn, watched, watered and protected, and the growth, general health, etc., of the various plants carefully noted. In order that there may not be misleading results from digging from an exceptional spot, several hundred pounds of soil are gathered together from many different parts of the

field and these all thoroughly mixed so that a fair average is thus obtained.

The foregoing are only a few of the many interesting papers read at the Congress and now published in full with the discussion. Several were reviewed in the November issue of THE INDIA RUBBER WORLD, and several others have been reserved for special notice in subsequent issues. The volume closes with a full report of the proceedings of the Congress, banquets, receptions, etc.

FIRST INDUSTRIAL DIRECTORY OF PENNSYLVANIA 1913. Bureau of Statistics and Information, Harrisburg, Pennsylvania, 1914. (Octavo, 778 pages, paper covers.)

This volume, as its name implies, is a directory of the industrial establishments in the State of Pennsylvania, to which are added the boards of trade, business men's associations, chambers of commerce, manufacturers' associations and miscellaneous societies, and also the labor organizations. The general industrial establishments are divided under 15 headings, according to the nature of the occupation. There are some 75 names under general rubber goods. Of this number 8 are manufacturers, the others being wholesale distributors or branches of manufacturers in other States. It is obvious that this volume must prove most useful to anyone who wishes to increase his business relations with commercial interests in Pennsylvania.

RUBBER TOYS IN AMERICA.

By a German Toy Expert.

GERMANY has exported to the United States during the last four years toys to an average value of from seven to eight million dollars. Adding to this the very large quantities which are now being produced in this country, it is easily seen that the amount spent every year for toys in America must be a very large one. Rubber is not playing a conspicuous part in this trade; in fact, neither American nor German statistics go very deeply into this branch of the trade. An inspection of the stocks of the large stores during the Christmas holidays showed that no great interest was taken in the sale of rubber toys. Some of the largest New York concerns were showing only a small selection, of the cheaper description, while others apparently did not seem to trouble at all about them and were offering them at the regular rubber goods counters. There is, further, the interesting fact that most of the rubber toys sold in New York are to be had at the retail drug stores. In fact one of the best selections of rubber toys can be seen in one of these stores whose name has become a household word in retail drug distribution. In a certain way this seems to indicate that the buying public regards the rubber toy as an article of sanitary value which can be given to children without any risk to the health or the welfare of the child.

And this very feature—the absence of danger in the use of rubber toys—makes them especially suitable for very young children. The child cannot hurt itself or others with the toy, which can be easily cleaned without any injury to its appearance.

It seems, however, that no great effort has been made to propagate the sale of rubber toys. In consequence, their sale in the United States is possibly smaller than in any other country. Toy traders in general do not seem to view the article with great favor, but there are concerns outside New York which seem to be able to dispose of very considerable quantities. The demand is mostly for the red or gray article, although there is a limited sale in colored goods. The buying public seems to distrust highly colored rubber, possibly fearing that the color will come off and injure the health of the child. Quite apart from the fact that no manufacturer would allow the use of poisonous or injurious enamels in the production of this article, there is of course to be taken into

consideration the extra cost of the colored article, for enameling must be done carefully to give good and reliable results. I hear that at least one of the large concerns selling in this market is receiving orders for colored rubber toys. The German manufacturers find that they have added largely to the selling possibilities of their product by introducing expensive and artistically colored novelties. They are selling now fairly large quantities of this article ranging in retail price up to \$4.00.

The average retail price of red and grey rubber toys in this country is about 25 cents to one dollar. More expensive goods of course are sold, but the bulk of the trade is done in this line, which represents, generally speaking, about the same class of rubber toy manufactured in and exported from Germany. Rubber toys are produced by a number of German manufacturers, but only two have really made a study of their production and have created any large number of designs. Competition outside Germany has been comparatively small, and in consequence those two firms have gained something like a monopoly of the trade. Of course there are a number of markets which are now closed to German activity. These markets are open to the American and English manufacturers who care to enter the field. Among them Australia and Canada may be mentioned. There is no doubt that when the war is ended German manufacturers will find their business in those markets seriously curtailed.

In neutral markets the following points will have to be considered: When the war broke out most of the orders on hand had been completed but were not shipped. These could not be cleared during the mobilization, but after about four weeks ordinary goods trains began to run again and it has been possible to ship most of the goods ordered. Taking into consideration that about one-sixth of the world's market has been closed to German enterprise, it follows that quantities of the toys manufactured are still on hand. There will be a surplus supply, even though all shipments reach their destinations. This seems actually to be the case, and the stocks in hand of the foreign agents are said to be fairly large. In addition there might be a tendency to sell cheap, which, however, is counterbalanced by the increased freight rates which had to be paid by the German manufacturers, rates having in some cases doubled since the outbreak of the war. There has been no prohibition of the export of rubber toys from Germany, and neither England nor any of the other countries have shown objection to the shipment of these articles. On the other hand, the government has practically taken over the whole production of rubber goods in Germany for war material purposes, and no rubber is available for the manufacture of any other goods, quite apart from the fact that the increased price of rubber would make them too expensive to compete.

With Germany, France, Belgium, Austria and Russia out of competition, only England would remain of the European rubber manufacturing countries which could satisfy the demand for rubber toys if such a demand should arise in the near future. But it is very doubtful whether English rubber manufacturers will care just now to go into practically a new line which would require a good deal of attention and outlay before it could be successfully established. Only the United States manufacturer seems to be qualified for the task. It remains to be seen whether the manufacture of rubber toys will be regarded by the American producer as large enough a proposition to be handled.

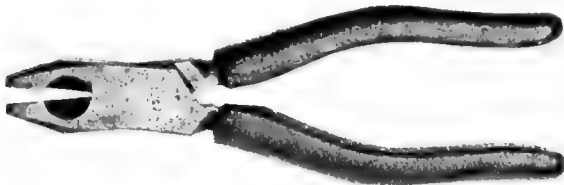
A new compound for injection into tire tubes to prevent punctures is being introduced. It is called "Purple Wonder." [Schutt Bros., Homestead, Florida.]

In toy making factories paint is applied to wooden toys by a pneumatic spray attached to a rubber tube.

New Rubber Goods in the Market.

"RUB-STEEL" PLIERS.

HERE is a cut illustrating "Rub-Steel" Pliers, a safety device valuable in handling high voltage wires. The pliers are first treated by an electro-chemical process which places on the metal a coating in sympathy with rubber and by which a chemical union is secured during vulcanization so strong that it is claimed the rubber will break before the adhesion is disturbed.



These pliers have withstood tests of 13,000 volts, when wet, without breaking. The rubber covering is about one-eighth of an inch thick and in addition to its electrical resistance, insures a better grip and less liability to accidents from dropping. (Voorhees Rubber Manufacturing Co., Jersey City, New Jersey.)

SANDERS' SANITARY MILK BOTTLE CLOSURE.

The above title gives an accurate if somewhat condensed description of the article illustrated below. A full and complete description would contain the further information that this closure is made entirely of rubber. It is a rubber cover that fits over the top of the milk bottle, gripping it so closely around the neck as to be air-tight in any position, thus protecting the contents of the bottle from outside unsanitary influences. Expansion of the contents due to freezing has been duly considered in the design of this cover, the efficiency of which is preserved under such circumstances, owing to the elasticity of the rubber. The manufacturers state that not only is the flavor of the milk not affected by this rubber closure but that it prevents affection by any other article of food near which the bottle may be placed. It can be sterilized in boiling water and will last for a long time, and, being of soft rubber, it is easily slipped on and off the bottle. [United States Bottle Closure Co., Chelsea, Massachusetts.]



THE AMERICAN WASHER.

This is a new washing machine which operates on the vacuum principle. In size and general appearance it resembles the ordinary clothes wringer, and the illustration shows it attached to the laundry tubs in the same way that the ordinary wringer is attached. This machine has two rubber rolls, turned by a hand crank, and the surface of each of these rubber rolls is covered with suction cells. The clothes to be washed are soaked for a half hour or more in warm, soapy water, after which they are passed back and forth, as in a wringer, between these vacuum rollers, until all the dirt has been drawn out by the rubber suction cells, of which there are 131 in each roller. The operation is then repeated in rinsing, bluing, starching and wringing processes. An automatic tension device adjusts the machine instantly to changing conditions, and it is said to be suitable alike for washing the most delicate fabrics and for blankets, etc. (American Washer Co., New York.)



RUBBER IN THE KITCHEN SINK.

A soft rubber tip on the hot water faucet in the kitchen sink represents that rare combination—economy and convenience.

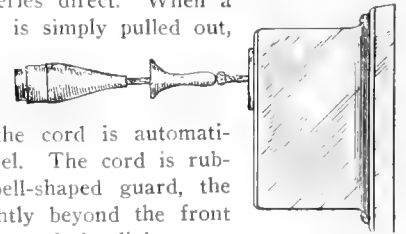


With faucets thus protected there is decidedly less chance of dishes being broken or chipped, and the dish washer can realize all the joys of her occupation without the exercise of constant care in this direction. The illustration shows such a tip applied to an ordinary faucet.

A rubber cap of this sort has just been placed on the market which contains within it a number of sieves to strain the water, and which is intended also to prevent splashing in the sink. This cap can be taken off and washed with a brush.

AN ELECTRIC CIGAR LIGHTER FOR AUTOMOBILES, ETC.

Here is a cigar lighter that no wind will blow out and that the automobilist or yachtsman may avail himself of without even the necessity of producing a match box from his pocket. It is an electric device in a case about $3\frac{1}{4} \times 3 \times 2\frac{1}{4}$ inches, made in both flush and non-flush types, a side view of the latter being here shown. Inside the case is a reel which carries 40 inches of cord. The device is connected with the lighting circuit or with the batteries direct. When a light is desired the cord is simply pulled out, when the end of the lighter develops sufficient heat to light the cigar. When released the cord is automatically rewound on the reel. The cord is rubber-insulated, and the bell-shaped guard, the socket that extends slightly beyond the front of the case and the cover of the lighter are made of hard rubber. The illustration shows the cord slightly withdrawn, but when not in use the hard rubber guard is drawn into the case as far as the vulcanite socket will permit, and the lighter depends from the small length of loose cord. [Electric Automatic Cigar Lighter, 556 West Twenty-seventh street, New York.]



THE "PERFECTION" PEDAL PAD.

The two illustrations below show one of several forms of pedal pads of a new design on which patent is pending and which are being manufactured in sizes and styles suitable for every make of automobile. These pads, which are molded from rubber, have deep corrugations in their upper surface, to prevent the feet from slipping, and are said to cause less tension and strain than the metal pedal. A feature of this pad, and one which is very likely to insure its popularity with the automobilist, is its ease of attachment to the pedal. As will be noted, metal prongs project from the steel frame that encloses the rubber pad, and to apply the pad to the pedal these prongs are simply bent back over the frame. [Auto Pedal Pad Co., Incorporated, 794 Seventh avenue, New York.]



The Fisher rim-grip sub-casing is a new casing for use under the regular tire. It is made of rubber-impregnated fabric, such as is used in all pneumatic tires, of varying numbers of layers—depending on the size of the tire—vulcanized together. [The Western Auto Sub-casing Co., Inc., Los Angeles, California.]

WATERPROOF BAGS.

Waterproof bags are now made and sold in some variety, and the demand increases as their usefulness is recognized. A certain large store in a western city is said to have recently greatly stimulated sales in its children's department by giving a rubber-lined school bag to each purchaser of a pair of children's shoes. Another useful bag is the one shown in this small cut. It is a Mothers' Bag, the outside being of leather and the inside consisting of a removable rubber-lined bag. It has an outside milk bottle pocket, and the top is closed by a silk draw string. The handles are of leather, large enough to slip over the arm. (Sears, Roebuck & Co., Chicago.)



IMPROVED PASSENGER ELEVATOR LOCK.

This lock was designed to prevent rope-operated elevators from being started from another floor while taking on or letting off passengers. The shipper rope running through the lock is equipped at each floor with buttons that engage the finger pull in the lock and stop the car level with the floor, saving unnecessary starting and stopping of the car. As long as the finger pull is thrown forward the buttons prevent starting.



The improved passenger lock has all the advantages of similar devices, with the added one of being noiseless. The sound of the buttons striking against the lock and jaws

in the passing of the elevator up and down is eliminated by the insertion of a thick rubber bushing in the bell of the lock through which the shipper rope passes. The buttons themselves are furnished with thick rubber bushings. These absorb all noises and make this improved lock suitable for hospitals, hotels and all places where noises are especially undesirable. [Angell Elevator Lock Co., Boston.]

A NEW FOUNTAIN SHAVING BRUSH.

The accompanying illustration shows an interior view of the new Fesler sanitary fountain shaving brush. It is described as a "renewal specialty" because the cartridge through which the soap is supplied and which contains a sufficient quantity for fifty or more shaves, is renewable. As will be noted, a flexible rubber tube extends through the center of the brush well toward the end of the bristles. This rubber tube opens and closes automatically, and through it the soap is emitted from a non-refillable glass container or cartridge. The bristles are set in hard rubber, and the rubber tube extends so far toward the end of the brush as to enable the user to get the full benefit of the soap, at the same time preventing it from sticking to the base of the bristles. [Fesler Sales Co., Trenton, New Jersey.]

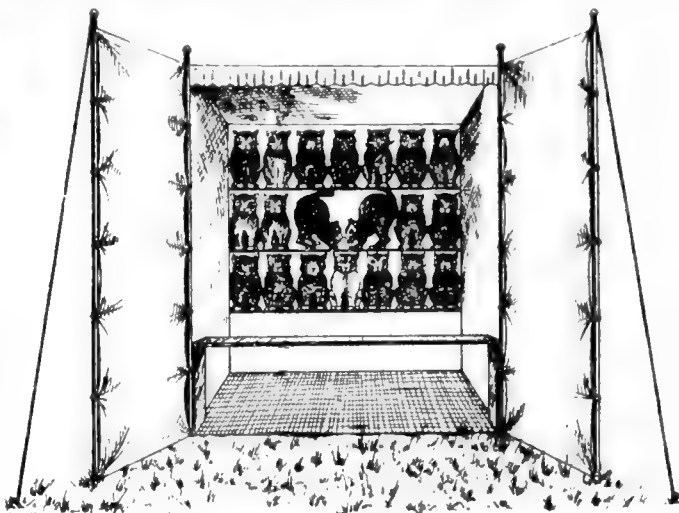


A new leak-indicator for use in locating leaks in underground pipes depends for tightness of connection when attached to water orifices on a soft rubber insert or gasket. [H. W. Clark Co., Mattoon, Illinois.]

A rubber insert has been adopted by one of the proprietary medicine companies to take the place of the cork insert hitherto used in the metal screw cap on medicine bottles.

RUBBER AT THE AMUSEMENT RESORTS.

An entirely new ball-throwing game has been devised, known as the Automatic Moving Ball Rack. It is 10 x 7 feet in size and has 18 dolls mounted on an endless chain moving across the face of the rack, operated by a motor or small engine. Two heads appearing above the back fence have



extra large faces, made of rubber. The dolls move continuously in one direction and are automatically re-set when knocked over, but the rubber-faced heads move in both directions.

Another new device of the same nature is the Cat Rack, an illustration of which is shown. The cats are made of heavy rubbered canvas and stuffed so that they resemble the genuine feline. Casey's Flats is a similar amusement apparatus, the windows of the flats being occupied by figures which it is the object of the player to knock over; while yet another is the "Mutt and Jeff" rack.

Everybody knows the old ball-rolling games popular at Coney Island and other seaside resorts and generally presided over by young Japanese gentlemen, where prizes are awarded according to your proficiency—or luck—in rolling



a certain number of balls into certain numbered holes in a table alley. A game of this sort called the "Devil's Bowling Alley," has just appeared which calls for a ball composed in part of rubber. The wooden portion of this ball is in one piece, and each ball has a numbered rubber slide concealed within it and held in place by a spring.

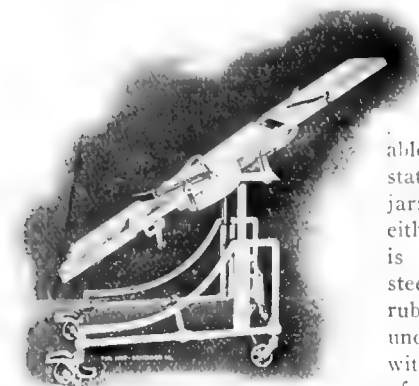
In the cut shown the slide is opened by inserting the thumb nail under one end and pulling it back. Another ball is made with a small button in the side which, when pushed, releases the rubber slide. These balls are kept constantly rolling on the alley. When you have paid the required fee you are provided with a three-pronged fork and, having selected the ball likely to secure you the most desirable prize, you proceed to spear it as it passes you. This accomplished, the prize in the prize rack which corresponds in number to the number on the rubber slide in the ball is awarded.

New devices of rubber appear from time to time to remove at least the undesirable risks from games of chance. The rubber poker chip appeared some time ago, and now comes a rubber mat with billiard cloth cover for dice shaking. This mat reduces the noise and, being made with a rim, protects the dice from falling on the floor; so that crap as well as poker can now be indulged in without danger of detection from the noise of rattling ivory.

DR. FRENCH'S CHAIR TABLE.

Doctors have discovered that certain surgical operations can be performed with less loss of blood and less strain on the operating physician with the patient in a sitting position, and this

had led to the invention of the operating device illustrated. This invention can be used in an upright position and is capable of conversion—it is stated without the least jarring or vibration—into either a table or chair. It is mounted on a tubular steel frame which has large rubber-tired wheels, those under the head end fitted with floor brakes. The top of the table is made in



three sections, covered with nicalloy, and the center section has a corrugated rubber mat to keep the patient from sliding forward when in an upright position. [The Kny-Scheerer Co., 404-10 West Twenty-seventh street, New York.]

WATERPROOFS FOR THE SICE.

Waterproofs are now quite popular garments with the sice or male attendant of the Far East, and the two illustrated

herewith give an idea of the styles most liked. One is a cape, with two buttons at the throat to hold it over the shoulders, and the second, intended for a groom or driver, is in regular straight coat style. Both are made of white vulcanized wigan sheeting of reliable quality to withstand the climatic conditions of that section, absolutely waterproof, and with all seams sewn. [Whiteaway, Laidlaw & Co., Limited, Kuala Lumpur, Federated Malay States.]

**THE "HANSA" BALL RACK.**

This is a device, invented and patented in Germany, for use in displaying rubber balls. It is a stand about 3 feet high having an upright metal center from which arms extend in various directions. Each of these arms ends in a ring, into which the rubber ball fits. The rack has ten tiers of these rings or hollow ball seats, in graduated sizes for balls of various diameters, as shown in the illustration. [J. Marx, Bottrop, i. W., Germany.]

**TWO NEW SOLES.**

The manufacturers of "Indestructible" rubber and combination soles, made in a wide variety of styles, in red, white and black, for all lines from children's to men's, have introduced a new feature. This is a leather toe tip, which is vulcanized to the sole. [New York Belting & Packing Co., 91-3 Chambers street, New York.]

The "Bantam" is a new light weight rubber sole. It is claimed that it possesses durability, flexibility and elasticity equal to soles of heavier construction, while all unnecessary weight has been eliminated. It is made in black, tan, gray and white. [Plymouth Rubber Co., Canton, Massachusetts.]

THE NASDCO HELMET.

The Nasdco Breathing Helmet is a protective device, the purpose of which is to prevent the wearer from inhaling noxious gases, fumes or smoke, and naturally adapted to fire fighting purposes.

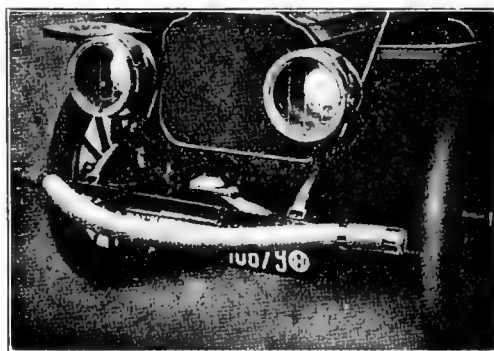


The helmet, consisting of a head piece and mask provided with openings for eyes, mouth and nose, has attached to its base a trailing rubber feed hose through which air is inhaled, there being always pure air near the floor. An opening in the top of the helmet provides for exhaling. The helmet weighs only 3½ pounds and requires no adjustment, neither does it interfere with the vision or hearing of the wearer or the full use of his hands and feet. [The National Safety Device Co., Cleveland, Ohio.]

**THE ELASTIC SAFETY BUMPER.**

This is a new automobile fender, the purpose of which is to protect both the pedestrian and the automobile should the two collide. The term elastic is applicable because it is composed in part of a hollow rubber tube which extends across the front of the automobile, supported on a steel fender, beyond which it projects about 2 inches. It affords safety to the pedestrian because of the elastic properties of this rubber tube, which serves as a buffer between him and the steel bumper. Beside which, this rubber tube takes up most of the shock and thereby prevents damage to the front of the car, the lamps, etc. The fender is easily attached to the car, and is fitted with an improved spring device. It is supplied in various metal finishes, and the rubber buffer can be stained and varnished in any color desired. [Douglass Manufacturing Co., 32 Broadway, New York.]

The accompanying illustration shows another fender made up of steel and rubber. The straight portion of the fender is a resilient strip of steel trussed to the curved member in front. This

**AUTOMOBILE WITH RUBBER BUMPER.**

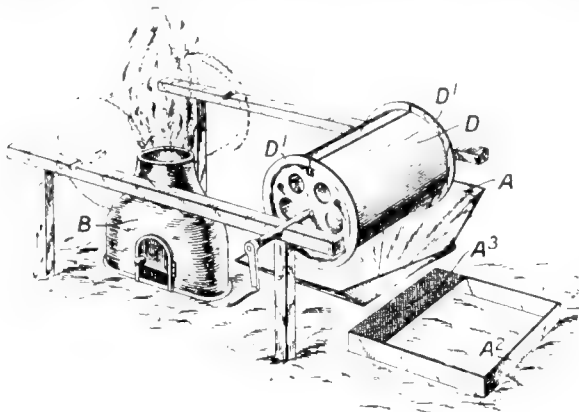
curved part has also a steel spring and carries on the front edge a rubber cushion 2½ inches in diameter. By this means, collision shocks are absorbed partly by the rubber bumper and partly by the flexible steel parts, which are supported on the front end of the car frame. [Auto Cushion Fender Co., Columbus, Ohio.]

The Kaufman Rubber Co., Limited, is adding to the electrical equipment of its plant at Berlin, Ontario. Certificate of incorporation was issued to this company January 25, its capital stock being \$2,000,000 in \$100 shares.

New Machines and Appliances.

COAGULATING LATEX.

RUBBER latex is smoke cured by repeatedly performing the following operations: Pouring latex on the external surface D of a drum to give a complete but thin coating thereto; rotating the drum to distribute the latex evenly, and thereafter subjecting the coated drum, while rotating it, to the action of smoke. The drum may also be smoked previous to being coated with latex, and after coagulation the outer surface may be smoothed by rolling upon a board. In the form shown, the flanged aluminum drum is built of readily separable parts, namely,—a sheet D with inturned ends clamped to a distance-piece, thus forming a V-shaped groove for the knife used for removing the sheet, and end plates D^1 . Surplus latex, caught in a pivoted receiver A , may be poured into a dish A^1 fitted



with a strainer A^2 . The film of latex is coagulated over a smoke-producing apparatus B . [F. Ripeau, British patent, No. 21,771.]

ATTACHING SOLES BY VULCANIZING.

THE sole is vulcanized to the shoe by the heat and pressure of a flexible metal surface. In the illustration the figure on the left shows a longitudinal section and that on the right a cross section. The metal surface is composed of a series of chains placed one beside the other and held at both ends by perpendicular screws b , which project through a common head-

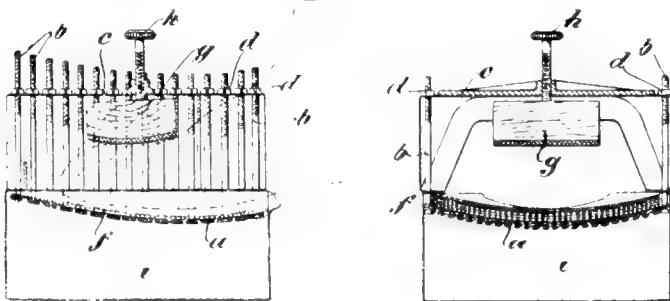
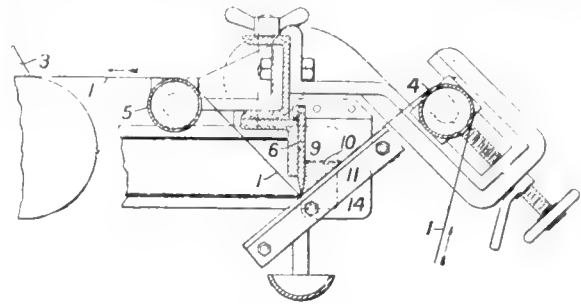


plate c . These screws are adjusted vertically by nuts d . The last, with the shoe and sole, is placed under pressure block g . The sole rests on a gauze packing f , laid over the chains to distribute the pressure and prevent cutting the sole. The screws b are then adjusted, pressing the chains tightly against the soles. Pressure block g , adjusted by the hand screw h , holds the shoe in place. Chamber i is heated by a gas burner or by placing the apparatus on a stove. [F. A. Antoni, German patent, D. R. P., No. 280,763.]

FABRIC IMPREGNATING MACHINE.

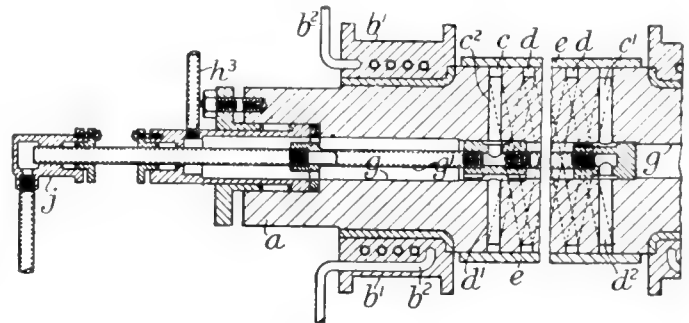
FABRIC is sometimes impregnated with rubber solution before being proofed. In the apparatus illustrated, fabric (1) passes over an adjustable roller (4) and a fixed roll (5) to the usual spreading machine (3). Between the rollers (4, 5) is a doctor (6), which depresses the fabric into a pocket (9) in which rubber solution (10) is placed. The rubber solution



is prevented from running out at the sides by guards (14), carrying pivoted angle-plates (11), which are adjusted to support the edges of the fabric. A plain or ribbed roller may be placed in the pocket (9) to bear upon the fabric and open the interstices. [W. A. Higham, British patent, No. 20,471.]

HEATING OR COOLING MIXER ROLLS.

THIS invention relates to rolls for mixing rubber. A casting a is formed with surface grooves c covered by a thin shell e for the circulation of heating or cooling fluid. It also

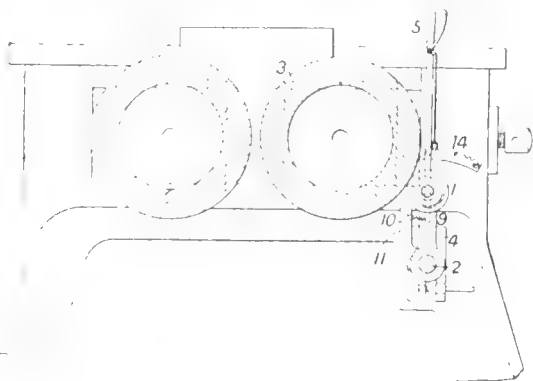


has one or more pairs of helical grooves c, d , whereby fluid can be circulated from both ends of the cylinder; also the bearings b^1 have coils b^2 for the circulation of heating or cooling fluid. Fluid is supplied through a pipe h^2 , whence it flows through a central cavity g and ports c^1, d^1 , into the grooves c, d , and passes away through outlets c^2, d^2 , into a pipe g^1 , leading to an outlet j . The fluid may be supplied from either or both ends of the cylinder. [C. H. Gray, British patent, No. 21,001.]

STRIP-CUTTING DEVICE.

STRIPS of rubber or rubber compounds, used in the manufacture of tires, are cut on a calender or warming mill by a series of disc knives (1), adapted to engage the material as it passes over a roll (3). Each knife (1) is carried by an arm (2) adjustably mounted on a shaft (2), journaled in bearings (4) which permit of a ready removal of the shaft. The arm (2) loosely engages the shaft (2), and is connected by a spring

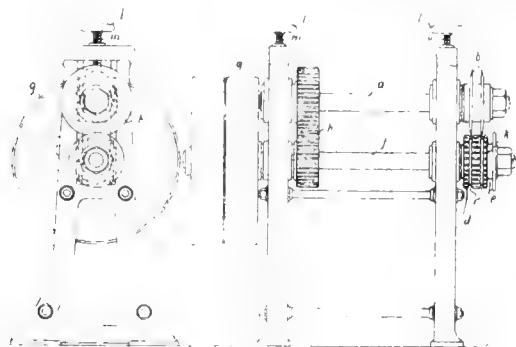
(10) with an arm (11) adapted to be rigidly clamped to the shaft. A lever (5) carried by the shaft (2) is provided with



a lock working over a toothed quadrant (14) to secure the cutters in the required position relative to the roll (3). [J. Rushmer, British patent, No. 22,008.]

A GERMAN BEAD TRIMMER.

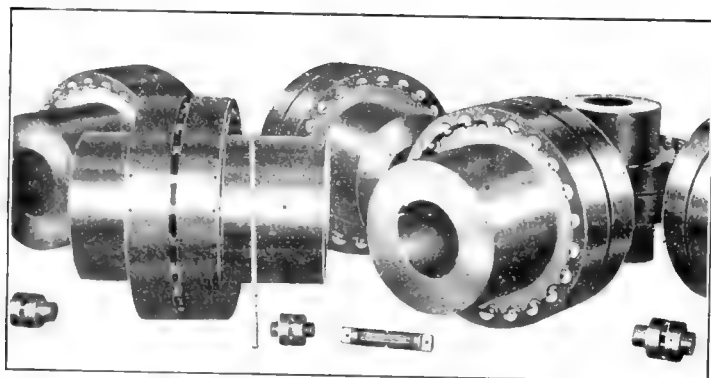
A FRONT view of the machine is shown in the illustration. On shaft *a* are the cutting discs *b*. These engage channels *c* of drum *d*, which has additional channels for receiving the beads. Drum *d* is keyed to shaft *f*, which is driven by belt



pulley *g*. Shaft *a* is driven from shaft *f* by gears *h*. Grooves *k* in drum *d* feed the tire to the cutting discs. The cutting discs *b* are adjusted by hand screws *m*. [O. Meir, German patent, D. R. P., No. 280,897.]

THE FRANCKE FLEXIBLE COUPLING.

THIS is simply an ordinary flange coupling connected by flexible instead of rigid bolts. The flexible pins are made of tempered steel leaves, held at each end by a keeper, which



prevents their getting loose or lost, and makes of each pin a flexible bolt.

The keepers are slotted at each end to engage spring rings.

which also fit in a groove in the coupling flanges. They hold the leaves in a radial position for driving, and also hold the keepers stationary in the coupling flanges.

All the leaves except two short ones at each end are slotted. The short ones are held stationary, making all movement come on the tempered steel leaves. The slotted leaves, of which there are hundreds, do the driving and distribute the work over a large area of hardened steel. The slots allow the coupling to adapt itself to any misalignment. When running, the leaves act similarly to the leaves of a carriage spring and with equal reliability and certainty of long wear. [The Smith-Serrell Co., Inc., New York.]

A NEW RUBBER TESTING MACHINE.

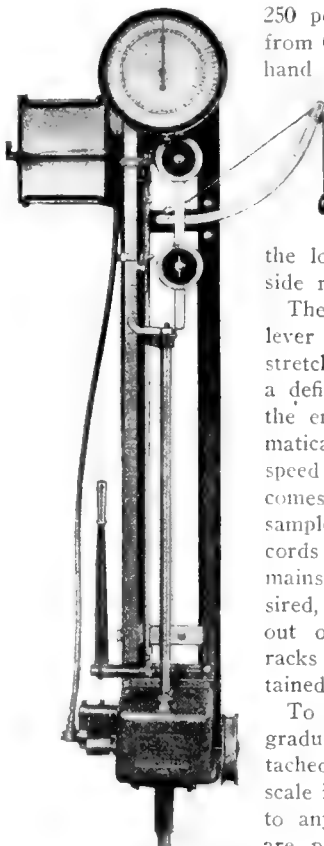
THIS machine is built according to United States standards and on the dead weight principle. Two heavy iron frames support the machine, which is about 7 feet long. It is attached to the wall to avoid floor vibration and is driven by a 1/6-horse-power motor.

The head of the machine has a dial with two rows of figures.

The outer graduations range from 0 to 250 pounds, by pounds, and the inner from 0 to 50, by fifths of pounds. One hand indicates on both circles the amount of stress required to break the sample. On the swiveling lever are two weights, the upper being fixed and the lower removable. Delicate tests are made by removing the lower weight and reading the inside row of graduations on the dial.

The test is started by means of the lever at the left, which causes the stretching screw to move downward at a definite speed without revolving. At the end of the stroke the tester automatically reverses and returns at high speed to its normal position, where it comes to rest ready to receive another sample. The pointer on the dial records the amount of the break and remains at that point until reset. If desired, the locking pawls may be held out of engagement with the toothed racks and an oscillating movement obtained for friction tests.

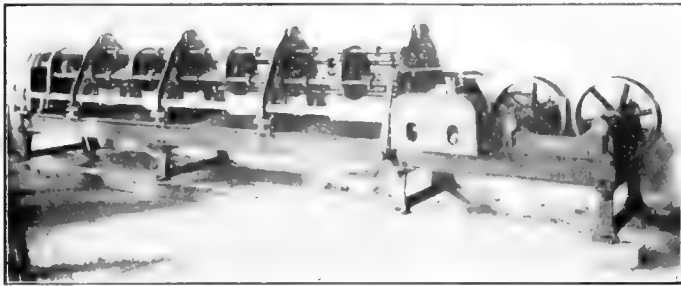
To indicate the stretch a brass scale graduated from 0 to 48 inches, is attached to the frame at the left. The scale is adjusted up to bring the 0 mark to any desired point. Upon the scale are placed two sliding pointers, which are easily moved by hand to follow marks upon the sample. To the lower pointer is attached a special flexible tape in a round metal case which automatically winds and unwinds as the distance between the pointers varies. This tape gives the net stretch between any two marks on the sample. Near the tape at the left is an automatic registering or charting device designed to hold a standard size letterhead on a flat platen by means of two rubber covered rolls. The break and stretch is recorded in ink on this sheet, which is then placed in a typewriter to receive further data for record. Several tests may be recorded on the same sheet to demonstrate variation in different samples. The movements of this recording mechanism are automatically begun when the starting lever of the machine is operated and automatically stopped when the machine is reversed. (Henry L. Scott & Co., Providence, R. I.)



A NEW STRANDING MACHINE.

BELOW is an illustration of a stranding machine that has recently been placed on the market. It will be of interest to manufacturers of insulated wire, as it is capable of much higher speed than machines of this type previously built.

This machine makes the bare copper strands, and also lays up insulated wires or strands into cables. It has 7 reels, taking spools 7 to 9 inches in diameter and capable of running at



800 r. p. m. The large machines take spools up to 32 inches in diameter, while smaller ones are built for making line wires, running as high as 1,300 r. p. m. Two-head tandem machines are built with 7 and 12-reel sections; also single-head machines with as many as 19 reels in one section.

These machines are accurately balanced and equipped with ball bearings, and the main bearing and driving gears are enclosed in oil tight cases. [New England Butt Co., Providence, Rhode Island.]

OTHER DEVICES.

ADAMSON COLLAPSIBLE CORES. Adamson has patented a core with a locking ring that can be used on the other side of the core when the flanges become worn. The four hollow segments, one of which is wedge-shaped, are aligned by interlocking keys and grooves. The locking ring is channeled to fit the core flanges, and wedges the segments of the core into perfect alignment, these being held by two conical pointed set screws. On the inner surface of the locking ring there is a V-groove for supporting the core on the chuck. [A. Adamson, United States patent No. 1,124,381.]

A later patent covers a core with fixed locking keys and locking bolts, operated by conical pointed set screws. There are no loose parts, all being located within or attached to the four segments of the core. The abutting ends of the segments are recessed to receive a broad, flat key, which is attached to one of the segments. In the opposite segment are recessed spring bolts with slots that engage the lower lips of the keys. Headless set screws with conical points engage the conical recesses in the bolts. The segments are assembled and aligned by the keys. The set screws being loosened, the spring bolts engage the keys. The set screws are then tightened, drawing the segments together. Dowel pins are inserted through the flanges at the joints, and the core is ready for the casing. [A. Adamson, United States patent No. 1,125,431.]

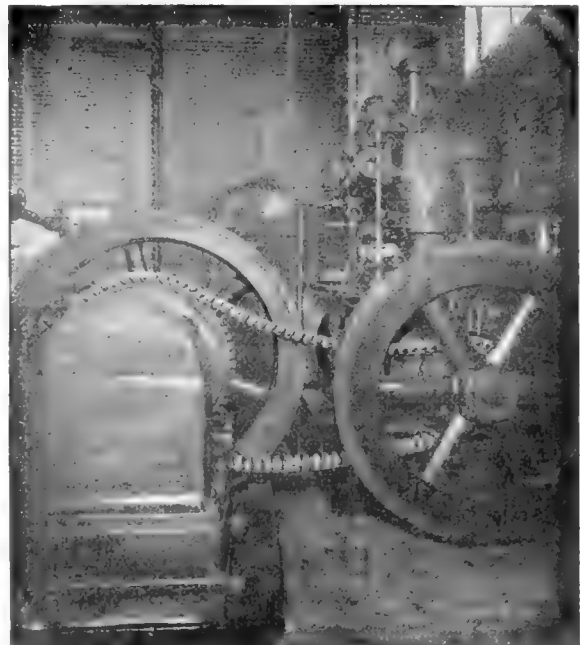
WICKHAM'S LATEX COAGULATOR: This invention distributes and coagulates, by smoke, films of latex on the inner surface of a circular revolving trough. The trough is attached to a spider mounted on the end of the main shaft, which is journaled to the frames and driven by a hand wheel or belt pulley. The outer side is open and has two sliding partitions for isolating the smoke from the lower part of the trough. It is entirely enclosed by a casing with the exception of three openings—one through which the latex is fed, another for the pipe which conveys the smoke from the furnace to the upper part of the trough and a third for removing the rubber. The drum is rotated and the latex is

delivered from a receiving tank to the inner surface of the drum by a reciprocating trough. The films of latex, carried around by the rotating cylinder, are hardened by the smoke. [H. A. Wickham, United States patent No. 1,126,327.]

BELT MAKING MACHINE. It makes multiple-ply belting from a strip of material which is marked, cut, folded and stamped by the machine. The parallel side frames form a long wide table with lower cross braces which support the longitudinal driving shaft. Bolted to the top of the side frames are upper parallel frames which carry the feed rollers, cutter and spool shafts, folding, stamping and doubling devices. The belting strip from the roll of material is passed over the table, which has adjustable bars for guiding the edges. Stylographic devices mark the lines along which the strip is to be slit and the material is finally rolled up at the end of the machine. The roll is then transferred to the upper frame and the material passed between the feed roller and cutting discs that cut the filler strips, which are then wound up on spools. The wrapping strip and the fillers are passed between feed rollers and through a device which folds the wrapping strip over the fillers in longitudinal alignment with the center of the belt. A printing cylinder stamps the identifying mark on the belt before it passes between the final feed rollers out of the machine to the finishing table. A belt of half the width is made by passing the folded material through the doubling trough and presser rollers mounted in front of the feed rollers. [A. D. Wright, United States patent No. 1,123,459.]

MORSE SILENT DRIVE CHAIN.

THE chain drive has a number of marked advantages. It has the positiveness of drive which is the characteristic of gearing and at the same time the possibility of running at a high speed without the extremely disagreeable noise that attends the gear drive. It also has the advantage of greater



flexibility. The silent chain consists of stamped links pivoted together into a multiple chain. It runs with a smooth action and is not affected by stretching, for when stretched the chain merely rides higher on the sprockets. The accompanying illustration shows an 85 horsepower Morse silent chain driving a compressor from gas engine. [Morse Chain Co., Ithaca, New York.]

News of the American Rubber Trade.

THE UNITED STATES RUBBER CO.'S ANNUAL MEETING.

THE following notice was sent out February 5 by the secretary of the United States Rubber Co. relative to the holding of the next annual meeting, which will take place in March:

"Notice is hereby given that the twenty-third annual meeting of the stockholders of the United States Rubber Co. will be held at the principal office of the company, in the city of New Brunswick, New Jersey, on Tuesday, March 16, 1915, at 12 o'clock noon, for the election of directors and for the transaction of any and all business that may properly come before the meeting, including considering and voting upon the approval and ratification of all purchases, contracts, acts, proceedings, elections and appointments by the Board of Directors or the Executive Committee since the twenty-second annual meeting of the stockholders of the company, on March 17, 1914, and of all matters referred to in the twenty-third annual report to stockholders, which will be sent to stockholders before the meeting, and in the proceedings of the Board of Directors and the Executive Committee which, until the meeting, will be open to examination by stockholders of record during business hours at the New York office of the company, 1790 Broadway."

FEDERAL COMPANY DEVELOPMENTS.

The Federal Rubber Manufacturing Co., of Milwaukee, Wisconsin, has now under way extensions and improvements to its plant which are expected to cost approximately \$500,000 and which when completed—probably by July 1—will enable the company to double its present tire output. New second preferred stock to the amount of \$1,000,000 has recently been issued to take care of this development, which includes also the establishment of branch offices and sales campaigns in sections of the country where the company is not now represented. The plant is said to be operating at present twenty hours a day, with a force of 1,200 operatives. With the completion of additions it is expected that about 400 additional employees will be taken on.

FIRE HOSE CONTRACTS.

The following are a few of the large contracts for fire hose that have recently been awarded by the fire departments of various cities: Boston Woven Hose & Rubber Co., Boston—2,000 feet—Pasadena, California; Empire Rubber & Tire Co., Trenton, New Jersey—2,800 feet—Detroit, Michigan; Eureka Fire Hose Co., New York—13,000 feet, Philadelphia—2,800 feet, Detroit—500 feet, Pensacola, Florida; Gutta Percha & Rubber Manufacturing Co., New York—400 feet—Detroit; Republic Rubber Co., Youngstown, Ohio—1,000 feet, Pasadena—750 feet, Madison, New Jersey.

Bids have been submitted on 40,000 feet of hose, in addition to tire and tube equipment, for the New York City fire department.

NEW PRESIDENT FOR WHITMAN & BARNES COMPANY.

The Whitman & Barnes Manufacturing Co., of Akron, Ohio, with branches at Chicago and St. Catharines, Ontario, which, in addition to manufacturing rubber hoof pads, distributes all varieties of mechanical and other rubber goods, recently held its annual meeting, when the following officers were elected: President, A. B. Rinehart; vice-president and general manager, A. D. Armitage; second vice-president, A. G. Hall; treasurer, W. H. Eager; assistant treasurer, E. A. Fisher; secretary, W. E. Rowell. C. E. Sheldon, who has been connected with the company for forty-seven years and has been president for the last thirteen years, although retiring from that position, retains his membership in the board of directors, of which he is chairman. Mr. Rinehart, the new president, has been connected with the company since 1893.

ELASTIC FABRIC MANUFACTURERS COMBINE.

An announcement received early in February, signed by T. Martin & Bro. Manufacturing Co., Chelsea and Lowell, Massachusetts; Hub Gore Makers, Boston and Brockton, Massachusetts; Leolastic, Bayonne, New Jersey, and Bridgeport Elastic Fabric Co., Bridgeport, Connecticut, states that the properties of these concerns have been sold to Everlastik, Incorporated, an organization formed to carry on the business formerly conducted by them.

Everlastik is a Massachusetts corporation with an authorized capital stock of \$4,900,000, divided between preferred "A" \$1,000,000, preferred "B" \$2,000,000 and common \$1,900,000. No new capital has been brought into this concern, which is simply a combination of interests. Its purpose is to minimize waste, to improve the quality of products if possible, and to more acceptably serve customers. None of the concerns are to lose identity or individuality, and goods will continue to be billed in the names of the separate concerns. The new company will maintain a New York office at 346 Broadway, and a Boston office at 179 Lincoln street.

The officers are: President, Bertram T. Martin; vice-president and counsel, John Abbott; treasurer, John E. Page; secretary and clerk, Walter L. Martin; assistant general manager, Charles B. Stretch; assistant treasurer and clerk, Wilwyn Herbert. The foregoing officers, with Samuel Lownds and Herbert S. Blake, compose the board of directors, of which the latter is chairman.

FISK RUBBER CO.'S GOOD SHOWING.

The report of the Fisk Rubber Co., of Chicopee Falls, Massachusetts, for the year ending October 31, recently issued, shows an increase of \$335,604 in net profits over those of the previous year, and an increase in surplus of \$229,725. The net profits for the year are given as \$942,204, and the surplus as \$432,204. Preferred stock dividends were paid during the year to the amount of \$350,000. The Fisk company on December 31 retired 2,250 shares of its matured preferred stock, and a new preferred issue of 5,000 shares at a par value of \$100 has been voted. It is understood that the proceeds will be applied to the working capital, the present rate of production and expected increases calling for large reserves.

CAPITAL STOCK CHANGES.

The American Tire & Rubber Co., of Akron, Ohio, has reduced its capital stock from \$500,000 to \$250,000.

The Federal Rubber Manufacturing Co., of Milwaukee, Wisconsin, has increased its capital stock from \$2,000,000 to \$3,000,000.

The Tire Co. of America, of Chicago, has increased its capital stock from \$5,000 to \$10,000.

The Johnstown Rubber Co., of Johnstown, Pennsylvania, has increased its capital stock from \$25,000 to \$100,000, and will erect a factory.

The I. T. S. Rubber Co., of Elyria, Ohio, has increased its capitalization from \$100,000 to \$115,000.

DIVIDENDS

The Republic Rubber Co., of Youngstown, Ohio, paid on February 1 a quarterly dividend of 2 per cent. on common stock.

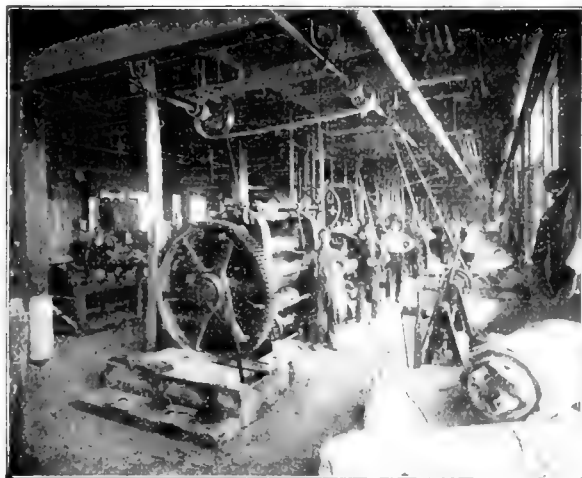
The Manhasset Manufacturing Co., of Putnam, Connecticut, which specializes in the manufacture of tire fabrics, has declared a semi-annual dividend of 3 per cent. in place of the usual 2 per cent.

WHAT THE APSLEY COMPANY HAS DONE IN THIRTY YEARS.

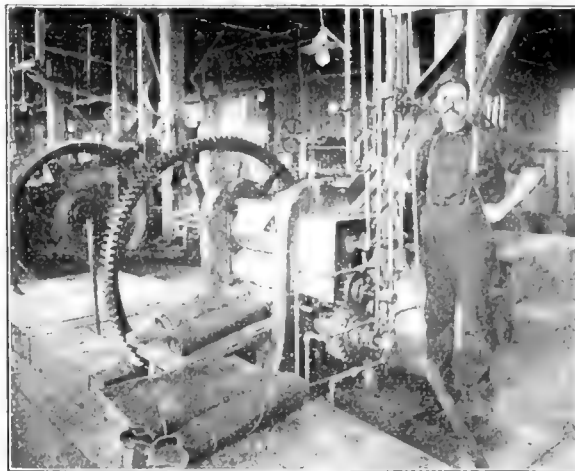
THE Apsley Rubber Co., of Hudson, Massachusetts, was established 30 years ago this year. The Honorable L. D. Apsley was its first president and treasurer and still retains

has not only vastly increased in volume but has increased also in variety. The simple styles of waterproof clothing made in 1885 have developed into the varied kinds of mackintoshes and rainproof garments now sent out from the Apsley factory, and several lines of heavy rubber surface clothing have also been added.

The manufacture of rubber footwear has become the largest



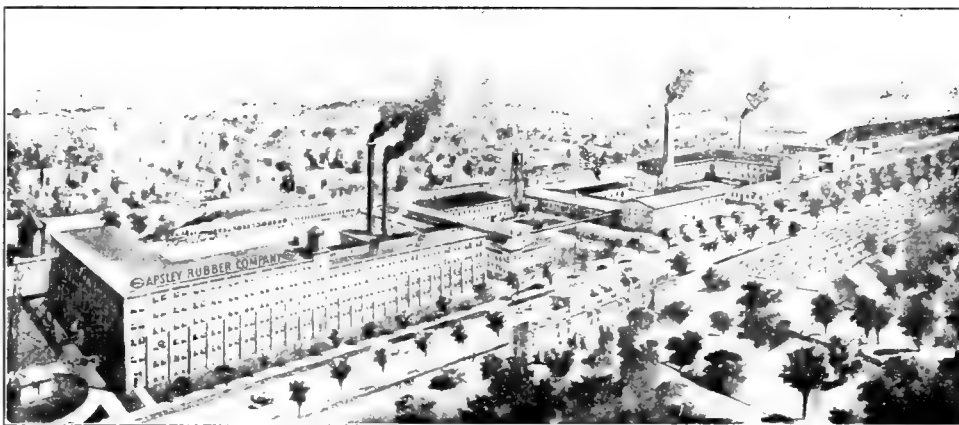
MILL ROOM.



CALENDER IN MILL ROOM.

the positions. Like some of the other important American rubber enterprises, the Apsley company started in a small way.

Its entire original plant consisted of two small rented wooden structures and the amount of capital was also small. Now the company is capitalized at over a million dollars and what its present plant looks like may be seen by referring to the accompanying cut. It is not only a capacious plant,



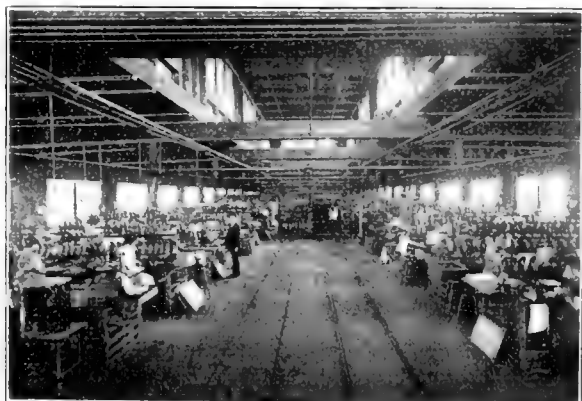
PLANT OF THE APSLEY RUBBER CO.

but a thoroughly modern one, equipped with the latest types of machinery and supplied with electrical motive power.

feature of this business. The company now makes three distinct grades of footwear. One is known as the "Deliverer" line. This

consists of heavy footwear made particularly for policemen and letter carriers, who, being on their feet all day, in all the varieties of weather that our American climate produces, naturally need footwear that is constructed for hard usage. Another well-known brand manufactured in this fac-

tory is called the "Rock Hill" line, specially made to withstand contact not only with oils and ammonia but with sharp



MAKING ROOM.



OPERATIVES MAKING CHINESE SHOES.

At the beginning its output was not only small but was quite simple in its character, but with the progress of years this product

projecting objects such as miners encounter in their work. Though the past season, owing to weather conditions, has not

been a banner one in the sale of rubber footwear, the Apsley company has continued running on a full ticket.

PICHER LEAD CO. HOLDS FOURTH ANNUAL CONVENTION.

A convention of the sales force, department heads, engineers, operators of mining properties and chemists, was held early in February by the Picher Lead Co. at its works at Joplin, Missouri. The convention lasted for three days, terminating on February 11 in a banquet at which O. S. Picher, the president, was toastmaster. R. W. Evans, of Chicago, treasurer of the company, in a convention address,



REPRESENTATIVES OF THE PICHER LEAD CO.

stated that while ten years ago the Picher Lead Co. ranked fifth as a producer of lead pigments, it is now the second largest concern of its kind in the country. All of the output—which is marketed in Canada, Mexico, England, France and Russia, as well as in the United States—is the product of plants in the Joplin district. The photograph reproduced above shows the assembled representatives, standing in front of and on a stack of refined pig lead estimated at about 1,500 tons.

TRADE NEWS NOTES.

The Werner & Pfleiderer Co., which manufactures machinery of all kinds for rubber mills, has moved its New York offices from 1031 Tribune building, at 154 Nassau street, to 41 Park Row.

The Mexican Crude Rubber Co. is remodeling its brick factory building at Detroit, Michigan.

About 50 of the electric light companies in Canada have united in forming the Canadian Electrical Association, for the co-operative purchase of supplies. This action is expected to result in lowering the cost of maintenance and of rates to the consumer, and also in a standardization of supplies.

The Newcastle Rubber Co., incorporated in January with a capital stock of \$500,000 for the manufacture of automobile tires and tubes, has secured a factory building 80 x 340 feet in area at Newcastle, Pennsylvania, where machinery is now being installed. Manufacturing operations will probably commence about April 1.

An announcement, dated February 25, has just been received to the effect that James C. Baldwin and Louis W. Dumont have formed the partnership of Baldwin & Dumont, to carry on a brokerage business in crude rubber and gums, with offices at 68 Broad street, New York, and in the Second National building, Akron, Ohio.

TRADE OPPORTUNITIES FROM CONSULAR REPORTS.

A firm in Europe which deals in dentists' supplies is in the market for gutta percha and other dental necessities. Report No. 15,420.

A business man in the Near East wishes to establish commercial relations with American manufacturers of machinery, rubber goods, etc. Report No. 15,450.

A business man in Russia wishes to secure names and addresses of firms in the market for old rubber goloshes, also the price being paid. He states that he can deliver from 300 to 400 tons a year. Correspondence should be in Russian or German. Report No. 15,664.

A business man in Denmark is in the market for large quantities of rubber tires suitable for automobiles and bicycles. Report No. 15,696.

A business man in Italy desires to get in touch with American firms manufacturing rubber shoes, with a view to representing them in that country. Report No. 15,703.

An Italian merchant requests names and addresses of American exporters of rubber goods. Report No. 15,712.

A South American importer wishes to be placed in touch with manufacturers of rubber goods, especially for chemical and toilet purposes, such as tubes, nipples, sponges, etc. Report No. 15,719.

TURNING A BICYCLE INTO A MOTORCYCLE.

A motor wheel has been devised which can be readily attached to the rear wheel of a bicycle so as practically to convert it into a motorcycle. The only effort required of the rider to start the machine is pushing the pedals around once or twice as is done in



a motorcycle. This wheel, which is only 20 inches in diameter, contains a one-cylinder, four-cycle, air-cooled motor specially designed for the purpose, which develops one full horsepower. The tire is a heavy double tube pneumatic clincher motorcycle tire, 20 x 1½ inches, with non-skid tread. [A. O. Smith Co., Milwaukee, Wisconsin.]

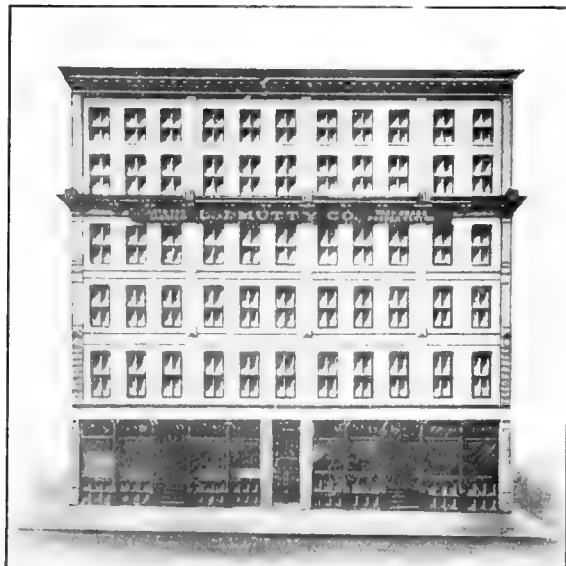
THE NEW FIRM OF H. J. HALABURT & SONS.

The firm of H. J. Halaburt & Sons, manufacturers and dealers in rubber goods, 36 South State street, Chicago, is a new one, but Mr. Halaburt is by no means new to the rubber business. He was connected with the Chicago Rubber Clothing Co. for 30 years, joining that company when a young man, in the capacity of factory shipping clerk, with particular charge of the gossamer department, when gossamers were the chief item in rubber clothing. He then spent 21 years as the company's representative on the road, and during the last 5 years, until he left to form the new company, he was general manager of the Chicago office.

Mr. Halaburt has associated his sons with him and expects in his new business to manufacture and deal in rubber clothing, particularly slip-ons and balmacaans, and rubber sheeting. He expects for a time at least to have quite a proportion of his goods manufactured for him by the best clothing and sheeting makers in Chicago and in the east.

THE NEW HOME OF THE L. J. MUTTY CO.

Announcement was made in the January issue of this publication of the removal of the L. J. Mutty Co. from 91 Federal street, Boston, to very much larger quarters at 175 Congress street, that city. Here is a reproduction of the Mutty company's new home. It is a fine modern building equipped with excellent



elevator service and, as the picture shows, generously lighted. The Mutty company occupies the fourth and fifth floors of this large building.

This company was incorporated January 1, 1909, with a capitalization of \$125,000. Increased business compelled a rapid increase in the company's capitalization, which was doubled in 1910, increased to \$350,000 in 1911 and to \$400,000 in 1912. The company manufactures a wide variety of rubber cloths and tubing, especially the better grade carriage cloth. A very large business is also done in tubing for player pianos. The officers of the company are: L. J. Mutty, president and treasurer; John B. Mutty, vice-president; F. H. Brown, assistant treasurer; Robert R. Gurney, secretary.

A "TWO MINUTE" TIRE RIM.

A new tire rim has been invented and patented by F. J. Demareth, of Milwaukee, Wisconsin, to manufacture and market which a company is now being formed in that city. This rim, which is to be known as the "Two Minute" quick detachable clincher tire rim, is simple in operation. It is in two parts, one the rim proper and the other an outside flange. The flange is connected with the wheel by means of six lugs and bolts, which can be removed with the fingers. In changing tires these lugs and nuts are slipped off and the flange comes easily. The tire is then slipped over the rim, the flange replaced and the nuts put back. The inflation of the tire causes the nuts to hold securely.

LARGE INCREASE IN MOTOR-TRUCK EXPORTS.

In December last the value of motor trucks exported from the United States was more than double the total value of all such trucks exported in the whole of the year 1913. The figures for last December, as reported by the Department of Commerce to the National Automobile Chamber of Commerce, are: 1,279 commercial automobiles, valued at \$3,387,729, as compared with 88, valued at \$100,660, exported in December, 1913; and 1,009, valued at \$1,686,807, exported in the twelve months of 1913.

Passenger cars exported last December numbered 1,297, worth \$998,698, bringing the total motor vehicle exports for the month to 2,576, valued at \$4,386,427, as compared with 2,389, worth \$2,152,144, in 1913, and 2,013, worth \$2,060,812, in 1912.

TRADE NEWS NOTES.

The Republic Rubber Co., of Youngstown, Ohio, has proposed to its stockholders a new stock issue, the proceeds from the sale of which are to be devoted, to the amount of \$2,500,000, to the retirement of present outstanding preferred stock which matured in September, and to the cost of necessary additions to the plant.

The McNaul Tire Co., whose tires have in the past been manufactured by one of the Akron tire companies, is now operating its own plant, on Miami street, Toledo, Ohio.

The Goodyear Tire & Rubber Co., of Akron, Ohio, has closed an arrangement for the handling through its branches of the "Invincible" tire gage, made by The United States Gauge Co., of New York.

At the annual meeting of the Universal Rim Co., held at Chicago on January 11, E. K. Baker was elected president.

The Hood Tire Co., recently incorporated under the laws of Massachusetts, will carry on the manufacture of tires for motor vehicles hitherto done by the Hood Rubber Co. as a part of its business. It will be conducted as a distinct organization.

A factory site has lately been purchased by the United States Wheel & Tire Co. at Rockton, Illinois.

The Henderson Tire Co., of Buffalo, New York, has filed certificate of dissolution.

The Standard Tire & Rubber Manufacturing Co. is planning the erection of a \$25,000 addition to its factory at Willoughby, Ohio.

The Chemical Rubber Co., of Chicago, has filed a voluntary petition in bankruptcy.

The property of Joseph Gordon, scrap rubber dealer, of Trenton, New Jersey, was sold at auction in that city on February 3. A. S. Kuhn bought most of the scrap rubber offered, at a price of \$6,500.

The Alliance Rubber Co., of Alliance, Ohio, at its recent annual meeting elected the following directors for the current year: Robert Auld, Milton Bejach, H. F. Bohecker, Simon Brady, M. S. Milbourn, W. H. Purcell, George C. Russell, J. C. Shively and A. W. Thomas.

The Endurance Tire & Rubber Co., whose principal office is at 1789 Broadway, New York, has just closed a contract for the erection of two new factory additions to its plant at New Brunswick, New Jersey. One of these is to be 35 x 37 feet, and the other a building 80 x 252 feet.

The Falls Rubber Co., of Cuyahoga Falls, Ohio, has purchased an unoccupied factory in that city and will remodel and equip it for the manufacture of tires.

The action of Congress in eliminating from the Post Office Appropriation Bill the clause providing for aeroplane service disposes of published reports to the effect that such a service is to be established between Kansas City, Kansas, and Kansas City, Missouri, and intermediate sub-stations.

A Board of Standardization is being organized at St. Louis, Missouri, by which it is hoped to effect a saving in the purchase of city supplies. The Supply Commissioner expects to save at least 15 per cent. on tire purchases for the city's 59 automobiles, the tire equipment of which during 1914 cost \$12,000.

The Detroit (Michigan) Board of Commerce offers a prize of \$500 for the best "Made in the U. S. A." trademark. It must include space for the name of any city, giving it a local as well as a national importance. John H. Patterson, president of the National Cash Register Co., Dayton, Ohio; James Keeley, editor of the Chicago "Herald" and Joe C. Lydenhecker, the American artist, have been requested to act as judges in the contest.

The Polack Tyre & Rubber Co., has leased a store at 10 West Sixty-second street, New York—the rear portion of the second floor and 7,500 square feet of basement.

PERSONAL MENTION.

F. H. Peaty has opened an office at 38 Vesey street, New York, where he will engage in the crude rubber business. This is a line with which Mr. Peaty is quite familiar, for, with the assistance of Samuel Kubie, then a member of Kubie, Herman & Co., he founded the Raw Products Co., one of the leading crude rubber concerns of the city, and continued active in the affairs of that company until two years ago, when he retired because of ill health.

William Perrett has been appointed Detroit branch manager of the Republic Rubber Co., of Youngstown, Ohio. Mr. Perrett is not only thoroughly acquainted with the tire business, having had 20 years' experience in this field, but is equally familiar with the trade of Detroit and vicinity. He is prominent in Masonic circles, being Grand Master for the State of Michigan, and Potentate of the Shriners at Detroit. His headquarters will be at 1001 Woodward avenue.

E. O. Hoepengartner has recently associated himself with the McQuay Tire & Rubber Co., of East Palestine, Ohio, in charge of special work in New York City, where he was previously in charge of a branch of the Swinchart Tire & Rubber Co.

F. H. Meggett, well known in the New England footwear trade, is now representing the Enterprise Rubber Co. in Rhode Island and Connecticut, carrying Candee and Federal lines of rubber boots and shoes.

William A. Inwood, for many years connected with The Rubber Regenerating Co. in the capacity of New York City representative, with offices in Grand Central Terminal building, recently severed his connection with the company, which has discontinued its New York office. The affairs of the Regenerating company will be administered from the Naugatuck plant. Mr. Inwood and his wife have left for California, where they will spend several months.

E. R. Branston, special representative of The B. F. Goodrich Co., of Akron, is now making a trip through the Far East, where he expects to spend about six months, visiting Ceylon, the Malay States, Java, Sumatra and parts of India and Africa.

Horace C. Pratt, for several years president and general manager of the Amsterdam Rubber Co., one of the wholesale footwear distributing houses of the United States Rubber Co. in New York, has removed to Cleveland, Ohio, where he has assumed the management of the Adams & Ford Co., engaged in similar distribution.

A. A. Templeton, for the past 16 years connected with Morgan & Wright, has resigned from that concern to become president of the Detroit Seamless Tubes Co.

Herbert A. Guthens, vice-president and sales manager of the Federal Rubber Manufacturing Co., of Milwaukee, is spending a six weeks' vacation at Jamaica and other Southern points.

B. H. Weibel has been appointed manager of the Firestone Tire & Rubber Co.'s Cincinnati branch.

H. I. Woodward, of the Knight Tire & Rubber Co. sales force, has been transferred from the Boston office to the branch at 215 West Fifty-first street, New York.

J. M. Ward, for the past two years a factory representative of the United States Tire Co., has been appointed manager of the branch at Indianapolis, Indiana.

D. Stuckelaker has been promoted from a position as salesman for the Firestone Tire & Rubber Co. to the management of the New York branch.

Thomas O'Callaghan, Jr., has been appointed manager of the Empire Rubber & Tire Co.'s branch at 240 West Fifty-fifth street, New York, succeeding J. B. Todd, whose recent resignation terminated seven years' association with the company.

COMMODORE BENEDICT MAKES A RESCUE AT SEA.

Commodore Benedict, who sailed on his yacht, the "Oncida," on January 2, for his usual midwinter cruise in southern waters, rescued the crew and eleven passengers from the dismantled sloop "Southern Cross" early in February. He towed the sloop into Monserrat, Leeward Islands.

TWO LIFE SAVERS GONE TO THE WAR.

Readers of New York papers will recall the wonderful feat of life saving that occurred off Sandy Hook last winter, when the oil tanker "Oklahoma" buckled and broke and the Booth line steamship "Gregory" rescued five of the crew. This rescue was effected only after an exhibition of daring rarely witnessed. The wreck occurred during a terrific storm, and the crew from the ill-fated tanker were struggling to save themselves on an overturned life boat. They were being swept by the "Gregory" when two of the officers—Second Officer J. S. Williams and Third Officer F. D. Roberts—leaped into the water, with their heavy clothes and sea boots on, and pulled the exhausted men to the life lines. Five out of the crew of eleven were saved in this way. These two officers, Williams and Roberts, known to many rubber men who have visited the Amazon, have joined the British army.

KEMPSTALL TYRE CO. REDUCES CAPITAL STOCK.

The Kempshall Tyre Co. of Europe, Limited, has reduced its capital stock from £175,000 to £2,400, the application for this reduction explaining that the original vendor sold patents at a large price and £120,000 had been written off these patents. The company was registered in London in December, 1906, with an authorized capital of £45,000, to adopt an agreement with Eleazar Kempshall to acquire certain patent rights relating to automobile tires and to carry on the manufacture of tires. Mr. Kempshall to be a director so long as he should hold shares to a value of £20,000.

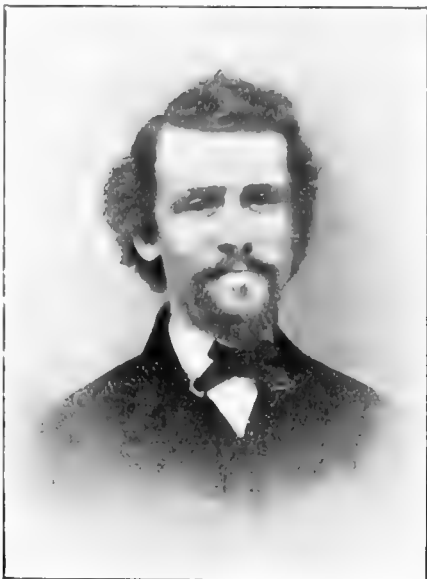
Eleazar Kempshall is an American, well known to the rubber manufacturers in this country because of his many inventions and patents relating to rubber. In the July, 1902, issue of this publication mention was made of 77 patents, with 874 claims, that had up to that time been granted him on golf and other balls, and many others were later allowed him on similar inventions. He also invented a golf club, to thoroughly protect which would involve 76 patents comprising 863 claims. Other of his inventions were the Kempshall hose band, illustrated on page 150 of THE INDIA RUBBER WORLD of February, 1893, and the Kempshall non-skid tire shown on page 363 of the issue of July, 1909. His first patents here were assigned to the Kempshall Manufacturing Co. He later withdrew from that company, becoming interested, in this country, in the Perfect Golf Ball Co. and the Kempshall Tire Co. He recently assisted in organizing the Globe Golf Ball Co., incorporated on January 13 of the present year, under the laws of Delaware, to make and sell golf balls and rubber or gutta percha articles.



ON A "SEA-GEAR" MOLDING AT PALM BEACH.

MR. BERTRAM G. WORK.

THE foundations of the Goodrich company were laid by Dr. B. F. Goodrich and Alanson Work. The former was an energetic creator of the promoter type, the latter a practical, clear-headed factory organizer with genuine mechanical genius. It was natural, therefore, that the present head of the company, Bertram G. Work, after his graduation at Harvard, should take an interest in the company for which his father had done so much, and in which he was a large stockholder. He began at the bottom, and, in course of time, became superintendent. As a persistent worker few of the scores of enthusiastic young men that made up the Goodrich staff were in his class. He was at the factory often before light, and stayed far into the night. He studied men and methods, created machines, experimented and organized, and his associates, recognizing his loyalty and ability, gave him a free hand. His vacations were spent in Europe, visiting and comparing notes with the leading rubber men in England, Germany and France.



ALANSON WORK.

Dr. Goodrich passed away; H. C. Corson retired; and when Col. Perkins gave up the presidency of the company, then growing great, Mr. Work of necessity took the reins. Under his leadership the company has continued and continues to expand.

Always interested in golf, he recognized the value of the rubber-cored ball when it was but a crude beginning. He

financed the Haskell company, perfected the ball, and incidentally saw to it that the inventor was abundantly rewarded, and that the Goodrich company profited largely.

His ability to recognize capacity, and willingness to accord to rivals their due meed of appreciation, brought him into close friendship with Arthur H. Marks when he came so wonderfully to the front in building up the Diamond Rubber Co., and it was largely his influence that eventually brought



BERTRAM G. WORK.

both Mr. Marks and the Diamond into the Goodrich fold.

Personally, Mr. Work is sturdily built, fond of horseback riding, golf and travel. He is not much of a talker, is never outwardly enthusiastic, but fond of his friends and absolutely indifferent to his enemies—if he has any.

MR. DAVOL TO HAVE A MODEL YACHT.

The yacht designed by A. L. Swasey for Charles J. Davol, president of the Davol Rubber Co., of Providence, which is being built at Robert Jacobs' yards at City Island, New York, is nearing completion. It will be a notable addition to the pleasure craft of the coming season. It is built of steel. Its general dimensions are 120 feet over all, 118 feet 6 inches on the waterline, 14 feet 4 inches extreme beam, 4 feet 9 inches draught and 8 feet 9 inches depth of hull, with a speed of 20 miles an hour. Power will be supplied by two of the largest size Winton motors. The accommodations are large and roomy for a yacht of the size, including owner's stateroom and several guests' staterooms, besides very spacious accommodations for the crew. The yacht also has a large cruising capacity of gasoline and water.

AN AMERICAN RUBBER PLANTER IN MEXICO.

George M. Havice, an American, formerly a resident of San Francisco and lately of Playa Vicente, Mexico, vice-president and general manager of the Playa Vicente Rubber & Development Co., Inc., recently submitted to a special correspondent of the New York "Herald" an affidavit sworn to before the American consul at Veracruz, containing a brief statement of indignities and atrocities perpetrated by Mexican soldier bandits, with Americans and other foreigners, as well as respectable representatives of their own race, as the victims. Mr. Havice states that he has lost everything on his plantation, the bare land alone being left him, and that may be confiscated any day. He describes raids made upon his plantation in one of which

five men, calling themselves "Villistas," demanded, under threats of shooting, 3,000 pesos (about \$1,500). As he had only 300 pesos, they took that, returning later to demand 4,000 pesos more. On being told that he did not possess this amount, he was struck over the head with their revolvers, knocked down, bound with a rope and dragged around the room. He states this is not unusual treatment and is only a small part of the things that many Americans are now suffering in Mexico.

MR. IVINS ON THE GERMAN VIEWPOINT.

Mr. William M. Ivins, who for several years was president of the General Rubber Co., contributed a half-column letter to the New York "Times" of January 29 on the attitude that Germany has maintained for a number of years past in regard to some of her smaller neighbors. He quotes from an article on Holland and Germany that appeared in "Die Grenzboten" in 1902, in which the writer, referring to Holland, makes this statement: "Her guaranteed neutrality is no more than a scrap of paper, which would prove worthless in war," then going on in an attempt to prove that Holland's only rational course was incorporation with the German empire. The particular interest of this article lies in the fact, as discovered by Mr. Ivins, that the expression "scrap of paper" as referring to international guarantees was used in German publications twelve years before the breaking out of the war.

Should be on every rubber man's desk—Crude Rubber and Compounding Ingredients; Rubber Country of the Amazon; Rubber Trade Directory of the World.

NEW INCORPORATIONS.

Chapin-Owen Co., Inc., February 4, 1915; under the laws of New York; authorized capital, \$25,000. Incorporators: Charles S. Owen, 91 Clarissa street, Charles T. Chapin, 27 Rutgers street, and Charles H. Chapin, 499 Culver road—all in Rochester, New York. To manufacture sporting goods, auto. tires and accessories, etc.

Chewlaxagum Co., The, February 1, 1915; under the laws of Delaware; authorized capital, \$50,000. Incorporators: B. H. Friel, S. H. Burke, and L. S. Dorsey—all of Wilmington, Delaware. To take over and operate the going business of the makers of chewing gum known as "Chewlaxagum."

Delaware Tire & Rubber Co., January 21, 1915; under the laws of New Jersey; authorized capital, \$125,000. Incorporators: B. C. Cohn, Newark, Roy J. Harding and W. Eugene Turton—both of Irvington—all in New Jersey. To manufacture, sell, buy, import, export and generally deal in rubber and other tires for automobiles, bicycles, carriages and vehicles of all kinds and descriptions.

Estes Airless Tire Co., January 25, 1915; under the laws of New Jersey; authorized capital, \$50,000. Incorporators: Milard F. Amonett, 258 Valley Road, West Orange; Benjamin F. C. Rothwell, 93 Frelinghuysen avenue, and Melchior J. C. Walter, 491 High street—both of Newark—all in New Jersey. To manufacture, sell, import, export and generally deal in inner tubes and tires for automobiles, etc.

Everlastik, Inc., January 22, 1915; under the laws of Massachusetts; authorized capital, \$4,900,000, of which \$3,000 was then to be issued for cash in full. Incorporators: Herbert S. Blake, 30 Church street; Harry E. Hanes and William Leslie—both of 56 Pine street—all in New York City. To manufacture, prepare, sell, buy, own and deal in any and every kind of textiles and other fabrics, etc.

Eveready Tire & Rubber Co., Inc., January 29, 1915; under the laws of New York; authorized capital, \$40,000. Incorporators: Willard J. Woodcock and Frank W. Woodcock—both of 102 Gates avenue, Brooklyn, New York, and Albert W. Norwalk, 720 Riverside Drive, New York City. To manufacture tires, etc.

Globe Golf Ball Co., January 13, 1915; under the laws of Delaware; authorized capital, \$100,000. Incorporators: Eleazar Kempshall, Hugher Oliphant, and Henry E. Davis—all of Washington, District of Columbia. To manufacture and sell golf balls and implements of and accessories to the game of golf, and articles composed wholly or in part of rubber or gutta percha.

Globe Rubber Tire Manufacturing Co., February 8, 1915; under the laws of New Jersey; authorized capital, \$250,000. Incorporators: Harry B. James, Sherman Square Hotel, New York City; Joseph P. Hall, 60 Hawthorne avenue, East Orange, and Spencer Weart, 273 Washington street, Jersey City—both in New Jersey. To manufacture rubber tires and inner tubes for automobiles and other vehicles or any accessories thereof.

Goodrich Rubber Co., The B. F., January 19, 1915; under the laws of Illinois; authorized capital, \$500,000. Incorporators: B. G. Work (president), 15 East Fifty-first street, New York City, and C. B. Raymond (secretary), Akron, Ohio. To buy, sell, repair and deal in rubber goods and accessories. Address of principal office, Detroit, Michigan.

Hammond-Williams Convertible Top Co., Inc., The, February 8, 1915; under the laws of New York; authorized capital, \$5,000. Incorporators: John C. Hammond and Aaron Rachofsky—both of 1328 Broadway—and Charles D. Williams, 114 East Twenty-eighth street—all in New York City. To deal in and to manufacture auto. tops, waterproof covers, slip covers, etc.

Hart Waterproof Manufacturing Co., Inc., January 24, 1915;

under the laws of New York; authorized capital, \$15,000. Incorporators: James I. Hart and James F. Hart—both of 960 Jamaica avenue—and Edward E. Berry, 52 Euclid avenue—all in Brooklyn, New York. To manufacture waterproof auto. slip covers, rubberized goods, etc.

House & Son Manufacturing Co., Inc., February 4, 1915; under the laws of New York; authorized capital, \$10,000. Incorporators: James M. Holland, 149 Broadway; Jacob Schreiber, 827 Hunts Point avenue, and Max Levy, 1172 Park avenue—all in New York City. To manufacture raincoats and rubberized fabrics, etc.

Indian Rubber Manufacturing Co., Inc., February 16, 1915; under the laws of New York; authorized capital, \$10,000. Incorporators: Bessie R. Bookstaver, 1040 Eastern Parkway, and Nathan Zobler, 716 Third avenue—both in Brooklyn, New York—and Adolph Grauer, 25 East Ninety-ninth street, New York City. To manufacture rubber heels and all kinds of rubber goods.

Kaufman Rubber Co., Ltd., The, January 26, 1915; under the laws of Canada; authorized capital, \$2,000,000, divided into 20,000 shares of \$100 each. Incorporators: Jacob Kaufman, Milton Ratz Kaufman, Alvin Ratz Kaufman, Mary Kaufman and Emma Ratz Kaufman—all of Berlin, Ontario. To carry on trade and commerce throughout Canada and other countries in rubber and rubber products generally, as importers, exporters and manufacturers. Location of principal office, Berlin, Ontario.

Lambkin Coupling Co., Inc., The, February 1, 1915; under the laws of New York; authorized capital, \$10,000. Incorporators: Crighton B. French, 1117 Carroll street, Brooklyn, New York; Charles H. Lambkin and George H. Lambkin—both of 615 West One Hundred and Forty-third street, New York City. To manufacture hose couplings, rubber hose, etc.

Lastic-Air Manufacturing Co., Inc., The, February 10, 1915; under the laws of New York; authorized capital, \$20,000. Incorporators: Oswald M. Mackie, Ethel M. Mackie and Allen T. Steward—all of Niagara Falls, N. Y. To manufacture auto. accessories, tire goods, etc.

Lesser & Co., Inc., Maurice, January 14, 1915; under the laws of Massachusetts; authorized capital, \$60,000. Incorporators: Maurice Lesser, 8 West Thirteenth street, New York City, and Alexander I. Stoneman and Alexander G. Gould—both of 610 Pemberton building, Boston, Massachusetts. To manufacture and deal in men's, women's and children's raincoats, overcoats, rubberized goods and kindred articles.

Midgley Tire Sales Co. of New York, Inc., The, January 28, 1915; under the laws of New York; authorized capital, \$50,000. Incorporators: William B. Wilson and Eliza T. Wilson—both of 69 West One Hundred and Thirtieth street—and George H. Wilson, 60 Beaver street—all in New York City. To deal in the products of the Midgley Tire & Rubber Co. of Lancaster, Ohio, having for its territory New York State east of Syracuse, New Jersey north of and including Mercer and Monmouth counties, and the State of Connecticut.

Mussinan Tire Corporation, February 15, 1915; under the laws of Delaware; authorized capital, \$3,000,000. Incorporators: Samuel B. Howard and H. O. Coughlan—both of 36 Nassau street, New York City—and James M. Satterfield, Dover, Delaware. To manufacture, buy, sell and deal in automobiles, bicycles, carriages and vehicles of all kinds made of metal, rubber and other materials.

Triplex Inner Tube Co., January 30, 1915; under the laws of Maine, authorized capital, \$200,000. Incorporators: Horace Mitchell (president), H. A. Paul (treasurer), and Horace Mitchell (clerk)—all of Kittery, Maine. To manufacture and deal in inner tubes and all automobile accessories.

TRADE NEWS NOTES.

The Ajax-Grieb Rubber Co., of Trenton, New Jersey, has enlarged its New York branch, now occupying, in addition to its old quarters in the Ehret building, a recently-vacated store adjoining these, at 1798 Broadway.

The Firestone Tire & Rubber Co., of Akron, Ohio, since the outbreak of the war, has opened branches in London, Australia and South America.

The Lee Tire & Rubber Co., of Conshohocken, Pennsylvania, is represented in Minneapolis and surrounding territory by the Northwestern Tire Co.—S. F. J. Kerner, manager—at 622 Third avenue, Minneapolis. The Philadelphia branch of the Lee company has moved from 324 to 660 N. Broad street.

The Double Seal Tire Valve Co., Inc., has been organized with sole rights to manufacture and market a new double seal tire valve. The company has been incorporated under the laws of Delaware, with a capital stock of \$150,000, its principal office at the present time being located at 1790 Broadway, New York.

The Peerless Tire & Rubber Co., of Toledo, Ohio, has removed to larger quarters at 713-15 Jefferson avenue.

The Divine Tire Co., Inc., of Utica, New York, organized in March, 1913, with a capital stock of \$225,000, has filed a petition in bankruptcy.

The Hamilton Rubber Manufacturing Co. and the American Belting Co., of Chicago, both under the management of Elmer E. Bast, have removed from 169 West Randolph street and are now located in larger and more suitable quarters at 1229-31 South Michigan avenue, in the automobile district.

The claims for reappraisal at 35 per cent., as materials composed chiefly of india rubber, on elastic cords imported by Mills & Gibb and appraised at 50 per cent., have been in some cases upheld by Judge Howell, in other cases the 50 per cent. appraisal being allowed to stand.

A mill and factory for the manufacture of asbestos products will probably be erected in the near future in the vicinity of Casper, Wyoming. Several companies wish to develop asbestos mines on a 640-acre tract of school lands in the Casper Mountains and the state board of school land commissioners refuses to permit such development unless a manufacturing plant is established. Three firms are stated to have tendered applications for the land, expressing a willingness to meet these conditions.

At the annual exhibition of automobiles and accessories in Boston, to be held at the Mechanics Building, commencing March 6, 24 makes of tires are to be on exhibition.

From St. Louis, Missouri, comes a record of unusual tire mileage, one tire—an Arrow tread—made by the Hood Rubber Co., of Watertown, Massachusetts, being reported in use for 17,000 miles on a 7-passenger car, and good for a further 1,000 miles; while another of these tires, on a rear wheel, gave 14,000 miles' service.

The Archer Rubber Co., of Milford, Massachusetts, is equipping its factory with modern fire escapes.

The Chester Rubber Tire & Tube Co., on February 2 resumed operation of its plant at Chester, Pennsylvania, with a force of 20 operatives.

Wisconsin Tire Co. is the title of a corporation organized in Milwaukee, Wisconsin, with \$40,000 capital, to engage in the manufacture and sale of automobile tires. The officers of the new company, which will have its offices at 188-192 Eighth street, are: President, Dr. G. A. Bading, Mayor of Milwaukee; vice-president, J. A. Werwinski, South Bend, Indiana; secretary, Louis M. Kotecki, City Controller; treasurer, Joseph P. Carney, City Treasurer; general manager, Fred G. Simmons, City Commissioner of Public Works. The tires the company will make will bear the trade mark "Badger."

A LIVELY THERMOID BANQUET.

The annual banquet of the Chicago forces of the Thermoid Rubber Co. was given under the direction of Mr. J. E. Dufield, district manager, on the evening of January 28, at the Tip Top Inn, in Chicago. Interest in the occasion was increased by the presence of Mr. D. O. Pohlman, the general sales manager of the company, and of Mr. "Bob" Burman, the "world's speed king." There were about 35 present, including prominent members of the Thermoid staff located in western cities and some of the large users of Thermoid goods. The menu is given below, not that it throws as much light upon the actual courses served on that occasion as it does on the general breezy atmosphere that prevailed:

MENU

Burman Gave
Crab Meat De Luxe
Oyster Omelet
Cream of Cornet Soup
D. O. Punch
All Mighty Tough Beef Tenderloin
Stone Braise Potatoes
Spaghetti a la De Palma
J. E. D. Spirits
Salad de la Thermoid
Folded and Stuffed Pie
Hydraulic Compressed Cheese
"Damn" Tossie

THE MANSFIELD TIRE & RUBBER CO.

The Mansfield Tire & Rubber Co., of Mansfield, Ohio, held its annual meeting on January 19, when a 10 per cent. dividend was declared, and the following officers were elected: President, Judge C. R. Grant, of Akron; vice-president and general manager, G. W. Henne; secretary, J. E. LaDow; treasurer, W. F. Henne, of Piqua, Ohio.

The company's plans for 1915 include an addition to the plant which will double its present capacity and the production of from 800 to 1,000 tires and 1,000 tubes per day. A new tire has been added to the line, the word "Ohio" standing out as a tread design on the non-skid casing. This company has just completed an order for 3,000 tires for consignment to an Australian port, the shipment going by way of the Panama canal.

ANNUAL MEETING OF RACINE RUBBER CO.

At the annual meeting of stockholders of the Racine Rubber Co., of Racine, Wisconsin, the total earnings for the year 1914 were reported as \$570,000 on sales amounting to \$2,400,000. The company has outstanding \$733,500 common stock, and \$310,000 of 7 per cent. cumulative preferred, and has a surplus of \$180,000. Indications, according to the report, are for a large increase in sales during 1915. The following officers were elected: President and general manager, H. L. McClaren—succeeding G. B. Wilson, who has held this office for the past three years, but has given up active interest in the company; vice-president and treasurer, Stuart Webster; secretary and general sales manager, H. C. Severance. These officers are also members of the board of directors, which also comprises L. B. Patterson, Joseph Weissenbach and L. T. Vance.

THE SOUTHERN TIRE & RUBBER CO.

The Southern Tire & Rubber Co., of Augusta, Georgia, commenced operation of its tire factory late in December, with a force of 30 employes, which it expected soon to increase.

This company has recently brought suit against Patrick Armstrong, former president of the failed Irish-American Bank of Augusta, for \$21,715.86, this amount representing the net deposit of the Southern company when the bank closed its doors on December 13. The charge is made that Armstrong, who is a large holder of local real estate, knowing the insolvent condition of the bank, transferred his stock in that institution and continued to receive deposits up to date of closing. The Southern Tire & Rubber Co. is the largest creditor.

THE RUBBER TRADE IN AKRON.

By Our Regular Correspondent.

EVIDENCE of renewed activity in the local rubber trade was produced February 20, when, for the first time in several weeks, The B. F. Goodrich Co. hung out a "Help Wanted" sign at the factory and advertised in the Akron newspapers for tire finishers. The Goodrich company has been taking on from 200 to 300 new employes each week for the past two months.

Officials of the company and of other Akron companies say that there is now plenty of rubber to supply their needs and that as the tire industry is beginning to show a marked recovery tire production will be rapidly increased. "We are now running at 75 per cent of our capacity," said H. E. Joy, general superintendent of the Goodrich plant, "and we believe the manufacturing situation will see a great improvement. Our tire business has had a large jump in recent weeks and this is necessitating an increase in output. All departments show signs of being benefited by the business revival." According to Mr. Joy, rubber officials are not worried by the German paper blockade and do not believe that it will have any serious effect on the local trade. He added that in the event the Germans succeed in stopping shipments of rubber from England, plans have already been made to ship direct from the plantations.

Akron rubber men were pleased to learn that B. G. Work has been named a member of the committee of the Rubber Club of America which will see that the proper certifications are made in shipments of rubber from the United States. Mr. Work's efforts at London in securing the lifting of the British embargo have given him a thorough understanding of the agreement by which rubber is permitted to be shipped, and his knowledge will be very valuable to the committee.

Stockholders of The B. F. Goodrich Co. will vote on March 10 on a proposed reduction in capital stock of the company. It is proposed to reduce the preferred stock from \$30,000,000 to \$28,000,000. The retirement of preferred stock, if approved, will reduce dividend requirements and make a larger fund available for a possible common stock dividend in the future. All stockholders of record February 27 will be entitled to vote at the meeting. Goodrich and Kelly-Springfield common have been two of the most active stocks on the market during the past month and holders of Goodrich common in Akron are confidently predicting that it will reach 60 before the end of the year.

* * *

The campaign of education for the benefit of tire users which is being conducted by the Firestone Tire & Rubber Co. is meeting with excellent results and is appreciated by patrons, according to an official of the company.

* * *

Rubber products are being manufactured in England on an enormous scale, according to Frank A. Seiberling, president of the Goodyear Tire & Rubber Co., who returned from that country to Akron February 22. Mr. and Mrs. Seiberling arrived in New York Saturday, the 20th, on the "Lusitania." While in England they purchased fittings for their new home on Portage Path.

"English factories are working seven days and nights each week to supply the needs of the allied armies," said Mr. Seiberling. "Freight of all kinds for America and elsewhere is piled mountain high on the English docks. The German blockade may have some effect on shipping between England and America but I do not think it will seriously affect the rubber trade." Mr. Seiberling is well satisfied with the arrangement made with the British government for the lifting of the rubber embargo. He went to London with B. G. Work, president of The B. F. Goodrich Co. who was the official representative of the Rubber Club of America in conducting negotiations for the lifting of the embargo.

According to Mr. Seiberling, London is now a city of march-

ing men in khaki uniforms and people in mourning. The restaurants are darkened, while hundreds of searchlights constantly watch for Zeppelins.

The two-piece rim is to be marketed by the Goodyear Tire & Rubber Co. during 1915. Agencies for Goodyear rims are being established in all parts of the country. The company is also making a special rim for heavy cars.

A circular is being sent out to dealers by this company warning tire users against the danger of overloading tires.

* * *

More than 30 "jitney" busses are now being operated in Akron and the number is growing daily. Tom Faron and Peter Dockerson, former rubber workers, were the first to enter the field here. One woman, Mrs. F. W. Danner, is also operating a bus. Good patronage is reported and the busses are cutting heavily into the receipts of the local traction company.

Motorization of all city fire apparatus has cut the cost of maintenance in half, according to figures compiled by John T. Mertz, chief of the department. It has been more than a year since motor apparatus completely replaced the horse-drawn apparatus in the local department, and although the number of fires during the past year shows an increase compared with the previous year the fire loss shows a decrease. Fire Chief Mertz says that it is due to the facility with which they can respond to an alarm that the fire loss is lower than ever before in the city's history.

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F. A. Seiberling, president of the Goodyear Tire & Rubber Co., has been named as one of the directors of the Chamber of Commerce of the United States. Mr. Seiberling was formerly president of the Akron Chamber of Commerce.

William F. Lawler, Jr., branch manager of The B. F. Goodrich Co. in New York City, was married in Akron, February 15, to Miss Louise J. Seybold.

E. C. Shaw, of the Goodrich company, and A. H. Noah, former treasurer of the Diamond, are spending a few weeks hunting and fishing in Florida. They have chartered a houseboat at Ft. Myer on the east coast.

H. A. Bauman, Goodrich department manager, was elected president of the Akron Rotary Club at the annual meeting in February.

J. S. McClurg, formerly of Akron, is now at the head of the McClurg Rubber Co., of Coshocton, which has taken over the business and reorganized the S. & M. Rubber Co. of that city.

J. W. Moore, driver of a test car for the Firestone Tire & Rubber Co., decided to quit driving rather than pay a \$20 fine in police court for speeding. He was given his choice by Judge Vaughan.

Among the social events of the past month was the annual ball of office employes of the Miller Tire & Rubber Co.

THE RUBBER TRADE IN BOSTON.

By Our Regular Correspondent.

BUSINESS in some lines is better, in others it still lags. The clothing manufacturers claim that last fall's beautiful pleasant weather, widely distributed over the country, has militated against the retail sales and as a consequence against good wholesale orders. There seems to be a better demand for low-priced goods than for finer garments. Tire manufacturers expect a lively season, with prices ruling lower, and now that the embargo is settled and crude rubber is available, they will run their factories to fairly full capacity from now on.

Mechanicals are moderately active. Makers of hose report good demand for the garden and mill varieties, but not for fire department hose. In boots and shoes there is a fair amount of

business at present, all based on guarantee of prices, which will be announced on the day this journal is published. The reclaimed rubber business is not over brisk; naturally the low price of crude interfering with the demand for reclaimed.

* * *

The opening of the new wing of the Boston Museum of Fine Arts, on the evening of February 3, was the culmination of the distribution for the public good of a portion of the wealth left by the late Robert D. Evans. This addition, which in its effect really makes the back of the building the principal facade, greatly enlarges this magnificent museum. Situated on the Fenway, this new front is not only magnificent in itself, but is reflected in the water so as to make an architectural picture rarely equalled in New England.

The front is of Greek architecture. Fluted columns of Maine granite, cut on the Ionic pattern, stand 22 in a close-set row along the 325-foot front. They run from the level of the ground floor 35½ feet to the solid upper wall. Above are three sculptures by noted artists. Each has two figures, and these groups represent Painting, Sculpture and Architecture. The interior is far finer even than the rest of the museum and excellently adapted to the purposes for which it was planned. There is a great hall for tapestries, galleries for paintings, small rooms for etchings and water color exhibits, a lecture hall and a splendid staircase, surmounted by a half-dome with Doric pillars. Here, cut in stone, is a memorial inscription reading:

IN LOVING MEMORY OF
ROBERT DAWSON EVANS
1843-1909
MERCHANT, FINANCIER AND
PATRON OF ART
A TRUSTEE OF THIS MUSEUM
BUILT BY HIS WIFE,
MARIE ANTOINETTE EVANS

Nearly 10,000 persons attended the opening and Mrs. Evans held a reception in one of the large halls.

This is another of the great gifts to the public by Mrs. Evans, who had previously built the Robert Dawson Evans Memorial Building as a branch of the work of the Boston Homeopathic Hospital.

* * *

The manufacture of rubber soles is receiving additional stimulus from the continued high prices for sole leather. Manufacturers of these soles are continually experimenting and improving their product. The latest in this direction is a leather tipped rubber sole. Soles answering this description are made by several manufacturers, and some shoe producers purchase the cut off soles and bevel on a toe of sole leather. The objection to this is that the joint separates with the action of the foot. The new sole has a very flexible leather tip skived and then vulcanized on the sole. It is claimed that this avoids all the troubles caused by the bending of the sole. The same manufacturers turn out a rubber sole with leather reinforcement along the tread of the big toe, where the greatest wear comes in tennis playing or in dancing.

* * *

Competition continues keen in the rubber heel business. One western manufacturer of such goods, the Federal Rubber Manufacturing Co., has put a working force in this city to visit every shoe repairer, to push the use of its rubber heels. A widespread advertising campaign is being run in connection with this canvass.

The latest manufacturing concern to enter the sole business is the C. J. Bailey Co., whose rubber heels already have a large sale. The soles will have an oval space covering the tread of the forward part of the foot, in which will be a design in U-shaped projections or bosses, similar to those in the Bailey heels. These soles will be made in white, red and black rubber and are pronounced un-slipable.

* * *

Announcements have been sent out of the marriage of Horace

E. Bailey and Miss Ethel Scannell, daughter of Burt R. Scannell of Beacon street, Brookline, on February 10. Mr. Bailey is the son of C. J. Bailey, the well-known rubber man in this city. He was a student at Cornell previous to entering business with his father. There is an element of romance in this marriage. Mr. Bailey called at the Scannell residence and invited Miss Scannell, whom he had known for some months, to ride in his limousine to the Brae Burn Club to dine. Instead of that they went to the station, thence to New York, and were married at the "Little Church around the Corner." It was a surprise, but in no sense an unpleasant one, to the parents of either bride or groom. They will be "at home" after March 1, at Surrey Road, Newton.

* * *

Some of the local manufacturers of eastern Massachusetts are considerably exercised over a bill now before the Legislature which would make it illegal for freight handlers on the railroads to work after 12 o'clock Saturday during May, June, July, August and September. Such a law would work a hardship to those who could not deliver their freight to the station in time to have it placed in cars before noon on Saturday. This would result in practically two days' delay at the start, and thus freight which should arrive in New York Monday could not get there until Wednesday, and corresponding loss of time would result for all other western receiving points.

* * *

Ira F. Burnham, president and treasurer of the Stoughton Rubber Co., gave an interesting talk on the gathering, curing and importation of crude rubber, and its manipulations in the manufacture of rubber clothing, before the Chickatawbut Club of Stoughton recently. The talk was illustrated with lantern slides depicting the various stages in the preparation of the raw product and the processes of handling the cloth, etc., in making up into garments, the former views being from pictures taken by members of the staff of THE INDIAN RUBBER WORLD, and the latter fully showing the various departments of the Stoughton Rubber Co.'s enlarged factory.

* * *

W. B. Loughton, well known in the rubber footwear trade and for the last fourteen years with the Apsley Rubber Co., occupying the positions of general selling agent and treasurer, has gone with the Hood Rubber Co. at East Watertown, Massachusetts, where he will be connected with the distributing end of the business. Mr. Loughton has many friends in the trade, and has had long and successful selling experience.

THE RUBBER TRADE IN TRENTON.

By Our Regular Correspondent.

THE Thermoid Rubber Co. is working two shifts of men in an effort to keep up with orders. The day shift works 10 hours and the night shift is on duty for 12 hours. This company has recently installed an additional 250 horse power boiler. A new battery of mixing mills has been placed in operation and a new John E. Thropp tire making machine has been installed. There are now 6 vulcanizers and 4 tire machines in operation. The tube department has been moved to a new building, thus giving the tire department a whole floor. The new mill line is operated by a 300-horse power electric motor. A 100-horse power motor has been installed to operate a new calender line.

J. O. Stokes, president of the Thermoid company, started in February on a three months' trip. He will visit California, also New Orleans and other Southern cities, and will spend some time in Cuba.

* * *

The Delion Tire and Rubber Co. is the latest addition to Trenton's growing colony of rubber manufacturing establishments. This company has begun business in its newly erected factory, a description of which as contemplated appeared in the June, 1914.

ISSUE OF THE INDIA RUBBER WORLD. The superintendent and factory manager is A. A. Peterson, a well known rubber man, formerly superintendent for the L. & M. Rubber Co., of Carrollton, Ohio. Mr. Lionel Emden, treasurer and general sales manager, is an automobile tire salesman who knows the business thoroughly. It is really because of an idea of his that the company came into existence.

A feature of the concern's output will be an all white tube. Mr. Peterson exhibited a section of this tubing to a reporter for THE INDIA RUBBER WORLD. The piece had been clamped into a kinked position for a long time yet when it was released there was not the slightest indication of weakening and the most severe test applied failed to disclose a flaw.

It is planned to have an initial output of 50 tires and 50 tubes a day. There is ample provision for rapidly increasing this capacity. The general sales offices will be located on Broadway, New York.

The Mecca Tire Co. is just getting ready for business in its new Trenton plant. The foundation work for the engines, boilers and other heavy equipment has been placed and the machinery is now being installed. L. T. Layton & Co., of Philadelphia are marketing the shares in this company.

Two hundred workmen have been added within the past couple of weeks to the force of the Empire Rubber & Tire Co. General C. Edward Murray, president of the company, said in a recent interview that the outlook for the coming season is bright in almost all lines, except that there could be a better demand for mechanical products.

Scores of laborers are clearing away the debris of the big tire at the Roebbling plant. F. W. Roebbling states that as soon as new buildings can be erected a strenuous effort will be made to catch up with back orders.

Ferdinand W. Roebbling recently donated to the Union Industrial home of this city \$20,000, as a permanent endowment fund, in memory of the late Mrs. Margaret G. Roebbling.

Superintendents and foremen of the Roebbling plant at Roebbling, New Jersey, to the number of about 40, held their seventh annual banquet February 10, at the Roebbling Inn.

The Acme Rubber Manufacturing Co. is working full time, with 600 hands. Commencing this month they are working overtime in some departments.

Articles of incorporation have been filed by the Hyatt Auto Top Co. This concern will deal in rubber and other equipment for automobiles, cars, carriages and boats. The capital stock is \$20,000.

Edward H. Sutterly, who for many years has been one of the department heads of the Vulcanized Rubber Co., at Morrisville, opposite Trenton, has retired from the rubber business to take a position as Postmaster of Morrisville. His former employees have presented him with a valuable gold watch suitably inscribed.

Rubber manufacturers, especially the tire people, are keenly interested in the fate of a resolution presented in the State Legislature by Senator Hutchinson providing for the submission to the people of a proposed amendment to the State constitution. Another thing the resolution provided that on and after July 6 of this year 50 hours shall constitute a week's work in any factory, shop or other place where the manufacture of any goods is carried on. The periods of employment shall be from 7 A. M. until 12 noon and from 1 until 5 P. M., every day except Sunday, when work must cease at 12 o'clock noon. Under this system it will be impossible for the rubber companies to work

in night shifts, which some of the tire concerns are now doing. The bill has already been favorably reported by committee. Inasmuch as the passage of the resolution would prevent the issuing of morning newspapers and the operation of gas and electric lighting plants, in addition to the other havoc it would work with conditions in general, it is hardly probable that it will ever get by the legislative body.

* * *

It may be interesting to readers of this paper to know that there are 20 rubber factories in Trenton.

THE RUBBER TRADE IN RHODE ISLAND.

By Our Regular Correspondent.

THERE has been no cessation in improvement in business conditions among the rubber factories of this state. Practically all of the plants are running on full time, with increasing orders ahead, while some are working extra hours. In consequence, all the competent rubber workers in this vicinity have steady employment, expert operatives being in demand. Weather conditions, combined with the effects of the European war, have resulted in bringing about the most active business situation enjoyed by the rubber industry in a long time. This is conclusively shown by the reports received from all sides. In some places, notably at Bristol, the concerns are even confronted by a labor scarcity problem.

* * *

Colonel Samuel P. Colt, president of the United States Rubber Co. and of the National India Rubber Co., Bristol, in speaking recently to the Bristol school authorities, announced material changes and increases at the plant of the National concern, whereby the number of operatives would be increased by 500 to 1,000, conditional upon the securing of expert workers. At present there are about 2,500 employed in the factory, principally working on the production of lawn tennis shoes and insulated wire. He also stated that he expected that these conditions would be permanent. This is about 100 per cent. increase over the average.

The new force will be employed gradually and it is understood that nearly another 500 will be taken on as soon as the building now under construction is completed and alterations have been made in several of the old buildings. This company is confronted by a serious problem in properly housing so many people and is making efforts to provide living accommodations for the increasing number of workmen and their families who have come into the town. The company's orders have been piling up rapidly, although the plant is now turning out something over 25,000 pairs of tennis shoes daily, which will be increased to a production of approximately 35,000 per day.

To eliminate danger to the employees of the grinding and calendering departments of the factory of the National company, a patent device for instantly stopping the machinery and preventing injury has been installed in several of the sections of shafting in the departments named. In case of accident, a clutch connected with the shafting and operated by an electrical appliance stops the shafting and gears.

* * *

An organization under the name of the United Motor Industries of Rhode Island was formed at the Narragansett Hotel, Providence, on the evening of February 4, by a large representation of automobile, tire and auto accessory dealers and others of this state, who have a common interest in the fact that all sell automobile tires. The organization aims to act as a board of trade for the industry in this state, settling trade questions, unifying practices and bringing into better acquaintance and better agreement the dealers in automobiles and parts.

A preliminary meeting had been held previously, under the auspices of A. M. Bannister, manager of the Providence branch of the Goodyear Tire & Rubber Co., of Akron, Ohio, and S. H.

Beatty, a local salesman. The speakers at this meeting included L. C. Rockhill, manager of the automobile tire division at the Goodyear company's Akron factory; W. T. Teagan, of Boston, New England district manager, and W. R. Bliss, manager of the Boston branch of the Goodyear company.

The new organization begins with a membership of nearly 70 and with officers as follows: President, Albert E. Goodby, of the Goodby-Rankin Co., Providence; vice presidents, Frank E. Kellogg, of the Providence Auto Equipment Co., Charles E. Thatcher and William S. Achorn; treasurer, Charles A. Paine; secretary, Henry Corp—all of Providence. Directors: Frank Crook, of Pawtucket; John R. Magee, of Bristol; Bernard Morgan, of Newport; H. L. Capron, of Attleboro; A. B. Smith, of Westerly; L. M. Jackson, G. H. Gifford, Charles R. Manchester, Herbert A. Thayer, John O'Donnell, Frank A. Glover and William Hughes all of Providence and William A. Flinn, of Narragansett Pier.

* * *

Nearly 100 of the employees of the Revere Rubber Co. have recently removed to Hartford, Connecticut, owing to the change in plans of the United States Rubber Co., the controlling corporation, whereby each of the different factories will confine its output to one line of goods. The employees who have left here for Hartford are those who have been engaged in making the pneumatic tires of the Revere company. Their places will be taken by employees from the Hartford, and possibly one other, factory of the corporation. All of the pneumatic tires for automobiles will be made at Hartford hereafter. The Revere company will devote its plant to the making of solid tires for trucks and other vehicles and rubber thread.

* * *

Charles J. Davol, president of the Davol Rubber Co., of Providence, was married recently to Lillian Amy Fuller, the ceremony taking place in North Kingstown. Mr. and Mrs. Davol have just returned to their home in Providence from an extended trip through the South.

* * *

Statements just issued by the American Wringer Co. show that the gross earnings for the calendar year of 1914 were \$246,233.60, against \$299,408.39 in the preceding year. The net earnings for 1914 were \$132,975.39, against \$160,184.04 in 1913. The surplus on January 1, 1915, was the same as on January 1, 1914, \$180,000. This is considered a good showing for a generally poor business year, dividends being kept up and allowances for depreciation being made.

* * *

Oliver Hoyt Blaisdell, for a long term of years chief engineer and master mechanic of the large plant of the National India Rubber Co., and since his retirement a year ago from active labor consulting engineer of the concern, died at his home on Bay View avenue, Bristol, February 20. He had been in poor health for several months and confined to his bed about two weeks.

Besides the important position which he filled so long and well at the factory of the National company, Mr. Blaisdell was a member of the sewer commission of Bristol, having served as such since the sewer system was established in the town a number of years ago. He was a Civil War veteran and served his country as a private in the 42d Regiment of Infantry, Massachusetts Volunteers. He was born at Alton Bay, New Hampshire, February 2, 1843. He removed to Bristol and joined the National company in 1886.

Michael Callan, employed for 40 years in the vulcanizing department of the National India Rubber Co. and retired on pension a few years ago, died at his home in Bristol, February 6, from a complication of diseases, after an illness of several weeks. He was in his 66th year.

* * *

The Consumers' Rubber Co.'s factory at Barrington is being operated under contract by Terence McCarthy, formerly super-

intendent under the old company. No transfer of the property from the hands of Robert W. Emerson, receiver for the corporation, has taken place, but it is understood that a plan has been perfected for the eventual taking over of the property.

The International Rubber Co., which manufactures rubber sheetings, at West Barrington, has been made the defendant in a suit for \$100,000 damages brought in the Superior Court by the owner of a large oyster bed, who claims that the waste chemicals flowing from this and other factories pollute the waters.

THE RUBBER TRADE ON THE PACIFIC COAST.

By Our Regular Correspondent

THE O. K. TIRE CO. is the name of a new San Francisco tire manufacturing concern, formed by Marion E. Oliver, of the Oliver Rubber Manufacturing Co., and Austin Kanzer. It will specialize in the manufacture, to order, of high-grade hand-made automobile tires, exclusively for the use of owners of large cars in and about San Francisco, Oakland, etc.; also in tubes, branded with the owner's name for purposes of identification. The tires are made with red side walls and white treads in three styles—the "Touring," the "O. K. non-skid" and the "Hickory" non-skid.

* * *

The Savage Tire Co., of San Diego, has started a campaign for the invasion of the Eastern tire field by opening a branch in Chicago. The Savage tire is made under the direction of A. W. Savage, the man who made Savage firearms famous.

A unique demonstration and test of strength of the Savage "Red Graphite" tube was recently made, when one of these tubes, in connection with a steam roller, was used to tow a street car weighing 26,000 pounds up a 12 per cent. grade. A 37 x 5 inch tube was used in this demonstration, spools being used to fasten the ends to the car and steam roller, with ropes run through the spools. Engineers of the car company figured that with the weight of the car and the friction developed in turning over the motors the pull on the tube equaled 7 tons. After the test the tube was inflated, and not a rupture, leak or weak place could be found. Pictures showing this novel use of a tire tube were taken by one of the film companies for the "movies."

* * *

The Kelly-Springfield Tire & Rubber Co. branch at San Francisco early in February moved into new quarters on upper Van Ness avenue. These new quarters have a floor area of about 15,000 square feet and comprise, besides offices and sales rooms, storage space for about 10,000 casings and tubes and a well appointed service department.

The Thermoid Rubber Co., of Trenton, New Jersey, has established agencies for its "Nassau" tires in San Francisco, San Diego, Los Angeles and Oakland, California, in Seattle, Washington, and Portland, Oregon. The Schmid-Jeffress Co. and the Tire & Oil Service Co. will handle the line in San Francisco and Peart, Inc., in Oakland.

The Federal Rubber Manufacturing Co., of Milwaukee, Wisconsin, has established an agency for its tires with the Spokane Cycle & Supply Co., of Spokane, Washington.

The Automobile Supply Co., of Tacoma, Washington, has added to its line the new Goodrich Silvertown and the Diamond tire.

The Republic Rubber Co. branch at Portland, Oregon, has moved from 233 Burnside street to 71 Broadway.

The tire companies on the Pacific Coast are all preparing for an unusual rush of activity during the spring and summer, the two great international expositions—the Panama-California, opened at San Diego January 1, and the Panama-Pacific, opened February 20 at San Francisco—adding to the inducement offered by the natural attractions of this Western country to visitors from the East.

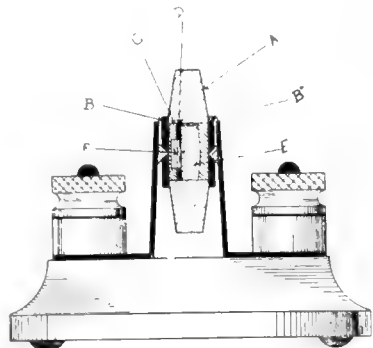
The first motor truck tire shipment made by the United States Rubber Co.'s plant at Providence to its Pacific Coast agencies since the change in manufacturing policy, was shipped by way of the Panama Canal.

A factory is soon to be established at Seattle, Washington, for the manufacture of spring wheels for automobiles, by W. B. Rosenberg, of Corbin, and W. A. Black, of Livingston, Montana.

A NEW DETECTOR.

The drawing herewith shows a new device that is of interest to the wireless man. It is used in connection with the receiving apparatus and enables the operator to detect the wireless signals that are difficult to get.

In this sectional drawing, *A* is a dielectric material made of hard rubber mounted in such a way that it can be rotated in order to adjust it. *BB* are conductors which pass the current. *C* is a conducting material. *D* is an insulating washer and *E* is the finely divided alloy which makes the contact with the sensitive crystal *F*. [Eugene T. Turney Co., 2595 Third avenue, New York.]



SECTIONAL VIEW OF THE NEW DETECTOR SHOWING THE VARIOUS PARTS.

THE CRAWLEY-BOEVEY TIRE CHAIN.

A non-skid attachment for solid tires is shown in the accompanying cut. To the chain that surrounds the tire, metal rings are attached at intervals. The superiority of this non-skid over the old crossbar type of attachment consists in the fact that the metal grips in suction cup form tend to prevent skidding in any direction. Another advantage is that it is less destructive to the tire, because, as compared with the flat bar, the ring attachment spreads the unavoidable strain over a greater surface. [National Steam Car Co., Limited, London, England.]



THE AIRLESS RESILIENT WHEEL.



The airless resilient wheel is a spring wheel in two parts, namely, the center and a floating rim. The rim consists of a solid rubber tire and two circular discs or grooved plates. The center part is an artillery wheel of wood or metal with six helical springs attached to the periphery by pivoted connections operated by twin rollers, secured to the guard plates of the

floating rim. By this arrangement any movement of the rim compresses the spring simultaneously and equally transmits the driving force. [Airless Resilient Wheels, Limited, London, England.]

WALTER DERBY HUTCHINSON.

Walter Derby Hutchinson, who died in Paris on the 19th of December last, was born in Middleton, Massachusetts, February 2, 1840. He was the son of Elisha P. Hutchinson. He attended Phillips Academy in his youth and at the age of 16 went to Paris, where, after passing his examination as a civil engineer



WALTER DERBY HUTCHINSON.

at the Ecole Centrale, he entered the rubber works which had been established by his uncle, Hiram Hutchinson, in 1853. It might be stated here that this was the first rubber factory in Europe to manufacture under the Goodyear patents. Mr. Hutchinson finally became general manager of this company and remained with it until he retired from active business, in 1900. After his retirement he still continued to reside in Paris.

ANDREW J. BATES.

Andrew J. Bates, well known to the rubber trade because of his prominence in the shoe manufacturing industry and in the distribution of leather and rubber footwear, died at his home in Webster, Massachusetts, on February 13, at the age of 76. He is survived, besides his wife and three daughters, by a son, Edgar Bates, who is president of A. J. Bates & Co., wholesale distributors of footwear, of New York.

A "MADE IN THE U. S. A." EXPOSITION.

An industrial exposition will be held at the Grand Central Palace, New York, March 6-13, where American-made and American-grown products will be exhibited. This exposition is under the auspices of the National Exposition Committee, composed of more than 100 leading American manufacturers. A national convention will be held at the same time, for the purpose of concentrating work in the interest of the "Made in the U. S. A." movement and to increase efficiency in stimulating American industry and domestic and foreign trade. The offices of the committee are located at 200 Fifth avenue, New York.

The Automobile Club of America has recently opened a fine new four-story garage on Avenue A, between Seventy-first and Seventy-second streets, New York. It has a floor space 125 x 200 feet, with capacity of about 300 cars. The equipment is up to date in every particular, practically every piece of apparatus, with the exception of the heating plant, being automatic, the installation throughout being of appliances made by the Cutler-Hammer Clutch Co., of Milwaukee, Wisconsin.

The India Rubber Trade in Great Britain.

By Our Regular Correspondent.

THE general position remains much as it has been for the last four or five months—exceptional activity with regard to military requirements for the British forces and their allies, with a slackness in respect to general mechanical and sporting requisites. As no doubt the arrangements come to with regard to the raising of the embargo on the export of British rubber to America have been closely followed in the United States, any detailed account in these notes would be lacking in news interest by the time of publication, and I shall therefore abstain from more than a word or two. That the general trade of America as well as the rubber trade in particular has suffered by the war is no doubt a fact, but what other country of any importance has not also suffered, and without the compensation of booking large orders for warlike material. The number of American business men taking orders from the different belligerents has been quite a feature of London hotel life. With regard to the special committee of three which has been appointed by the government to deal with all matters concerning the export of rubber to America, viz., Lord Balfour of Burleigh, Mr. Russell Rea, M. P., and Mr. Henry Birchenough, none of them can claim to bring any expert knowledge of rubber to bear upon their duties, though I do not wish to make any reflection upon their general fitness for their task. Lord Balfour—whose eldest son, the Master of Burleigh, has been killed at the front—is a statesman of considerable experience on departmental government committees. Mr. Russell Rea, who is a coal factor of prominence, served as chairman of the departmental committee on the Colliers' Eight Hour Bill, while Mr. Birchenough is a lawyer who has made a name for himself. The existence of this committee should do a good deal to reduce the expenditure of time formerly required in applying to the various authorities for permission to get rubber off to America under the new regulation. With regard to the shipment of rubber goods, all of which are conditional contraband, to neutral countries or British dependencies, manufacturers complain a good deal of the vexatious delays which occur in getting the necessary permits, such delays frequently causing steamer sailings to be missed. More especially is the delay resented in the case of small amounts of goods which could be of no possible use for purposes of war.

A record tender for 2,000,000 ground sheets was recently before the already busy British rubber trade. Naturally this was apportioned between a number of works, one of the largest recipients being Charles Macintosh & Co., of Manchester.

CLARK TYRE CO. LIMITED.

As some misunderstanding exists with regard to the position of this company, which has recently fitted up rubber mills at Crayford, in Kent, I may say that a special resolution has been passed for a voluntary winding up, after which the company will be re-formed to carry on business in the manufacture of the pneumatic tire brought out by Mr. Clark when living in Australia. The difficulty that arose in the management was due to the holdings of those of foreign extraction, cases of the sort having been not uncommon since the commencement of European hostilities.

WATERPROOF FOOTWEAR FOR THE TRENCHES.

It will be known to all newspaper readers that the war during the winter has been largely one of entrenchment, though, as our tax papers show, by no means of retrenchment. Discomfort would be a very mild expression for what the soldiers have experienced in standing in water, mud or snow, and it is not sur-

prising that leather footwear has been rapidly ruined and that many cases of frostbite have occurred. For some time nothing was done in the way of supplying rubber boots to the men, though many letters urging this course appeared in the press. More recently, however, two moves have been made. In the first place purchases of rubber boots were made from British makers, and doubtless from American supplies in London, and in the middle of January a large consignment of rubber boots arrived in England from Canada for transshipment to France. In the second place, what is called a wader stocking, to be worn inside leather boots, has been largely contracted for by the War Office. This article is quite a novel one, being the invention of Mr. F. C. Behr, well known in connection with monorail transport. Trenches have been dug near London and the efficacy of the new stocking proved in immersions of 14 to 20 hours duration. What the waterproofing consists of I have no reliable information but have reason to suppose that it is not rubber but wax, on the lines of the new waterproof capes lately brought out. With regard to the suitability of rubber boots for continuous wear there is a good deal of doubt in England, and in the army they have only been used by officers for early morning "stables," etc. Those, however, who can testify to their regular use by lumbermen and others in Canada combat the idea of unhealthiness especially if the boots have a fibrous lining and are not too tight a fit. With regard to the shipment from Canada mentioned above, it is no doubt a safe surmise that much of it was made in the United States, seeing that the United States Rubber Co. has such a large interest in an important Canadian rubber shoe works.

SOLVENT NAPHTHA.

Despite the large demand from spreaders, it is only quite recently that there has been any appreciable rise in price and in all probability this will not be permanent. The general situation with regard to tar distillation products is now largely controlled by the War Office Committee on the Supply of High Explosives, with which Lord Moulton, the scientific judge of the Appeal Court, is prominently identified. Not only naphtha distillation works but also collieries recovering tar and bonzole from coking plants have come under his close attention, and no product containing toluol can be sold generally without a special permit. Toluol of course is required for the manufacture of dinitro and trinitro toluol, so largely used nowadays in high explosives. Solvent naphtha consists mainly, and at the present time no doubt entirely, of the higher boiling hydrocarbon xylol, and as this must be produced in the distillation process and as it is not required for explosives, there is no reason to apprehend any shortage.

FORTHCOMING MANCHESTER MOTOR SHOW.

Although there is a pretty general consensus of feeling amongst engineers as to the undesirability of holding shows at the present time, it is announced that the North of England Motor Shows, Limited, are promoting an exhibition to be held in Manchester in April, to include motor cars, light cars, motorcycles, commercial vehicles, tires and accessories. It should be said that this show has nothing to do with the Society of Motor Manufacturers and Trades, who have abandoned their customary shows in London and Manchester. In connection with this matter the "Engineer," of London, remarks that the show can hardly expect to be representative of the motor industry of today as the trade is in no mood for this method of publicity. There are few new models to be introduced by leading British makers, while

the French and Belgian works are almost quiescent except for war vehicles. Perhaps, the "Engineer" suggests, America will furnish the bulk of the exhibits, which may be the reason for holding the show at such a time.

A NEW RUBBER COMPANY.

From the metaphorical ashes of the Lancashire Rubber Works, Limited, in Pollard street, Manchester, a new company, called the Pollard Rubber Co., has risen. Reference was recently made to the piecemeal sale by auction of the first-named company, which was in financial difficulties. The rather curious result of this sale was the total amount realized proved to be one-third more than the sum at which the plant and stock were offered by the auctioneer in one lot.

CONTINENTAL TYRE CO. (GREAT BRITAIN), LIMITED.

I referred in my January notes to the judgment given in the High Court in favor of this company as regards collection of debts in England during the war. This judgment was appealed and was considered by a special Court of Appeal presided over by the Lord Chief Justice, with the result that the judgment of the court below was upheld. This means that an alien company registered in England can maintain an action even though all of its shares are held by enemies. Germany cannot complain of any bias in our courts, though in England the judgment is by no means popular generally.

CRUDE RUBBER SHIPMENTS.

Henceforward it will be possible to state definitely the imports into and exports from the United Kingdom of waste and reclaimed rubber as from January 1 this year the British Board of Trade commenced giving the figures separately in their monthly returns. In January England imported 18,700 pounds and exported 383,900 pounds of waste and reclaimed rubber. Exports of raw rubber were less than one-half the quantity shipped during January, 1914. Here are the figures:

To—	1914.	1915.
Russia	1,591,500	737,200
Germany	1,850,300	.....
Belgium	660,500	.....
France	1,323,900	687,900
United States	3,556,400	766,600
Other countries	839,200	2,041,700
Total	9,821,800	4,233,400

Compared with the December figures there is, nevertheless, an increase of about 750,000 pounds in our total exports of rubber, all the importing countries having taken more with the exception of Russia.

ASBESTOS.

Asbestos slates, which are now largely manufactured in England, have recently found a new application, as they have been bought by the Admiralty to cover the decks of men-of-war to minimize the danger of fires when in action. It might be thought that there was not much to take fire on deck but this is evidently not the opinion of those in authority.

RUBBER HEELS IN ENGLAND.

The American consuls stationed at Huddersfield and Sheffield, England, under dates of January 5 and 8, reported on the rubber heel situation in their respective districts. From these reports it appears that the rubber heel is increasing somewhat in favor in England, as in the United States, and that prices range from 12 to 36 cents per pair at retail, the wholesale price being 12 to 25 per cent. below this figure. The charge for fitting is extra. They are supplied chiefly by domestic manufacturers, and while distributed to a certain extent through the jobbing houses, are more frequently introduced through the shoe manufacturing concerns, when special concessions in prices and terms must be made. Rubber heels are not advertised in these districts to any extent.

TRADE NOTES.

The employes of the India Rubber, Gutta Percha & Telegraph Works Co., Limited, of Silvertown, London, had subscribed, up to the first of February, £537, 13s. 3d. (about \$2,600) to National, Red Cross and Belgian relief funds, and it is their hope to continue as long as may be necessary to donate £100 monthly, to be distributed between these three funds.

W. T. Henley's Telegraph Works Co., Limited, whose London office—which has a floor area of about 6,000 square feet—is at 18 Union street, Moorfields, E. C., has by various additions recently doubled the size of its plant at Gravesend, and now has under way still further additions and improvements. This company is receiving large orders, particularly for solid tires.

The Wood-Milne Co. is another of the British concerns that have lately increased their productive capacities, having a new factory building under course of erection. The present capacity of the plant is said to be about 1,000 solid tires per week. The company also proposes to acquire extra land at Leyland on which to build further factory additions.

The firm of E. Parser & Co. has been organized to carry on in London the business of importing and dealing in crude rubber. Mr. E. Parser, the head of the new company, was for many years engaged in similar business at Antwerp, but owing to conditions arising from the war he has removed to London, opening offices at 9-10 King street, Cheapside, E. C.

E. E. Hodgson, for many years resident in the United States and for some time past interested in the Empire Rubber Co., scrap rubber and metal merchants, Leeds, Yorkshire, England, having joined the British army, his partnership with H. Waterhouse ("Rubber Billy") has been dissolved. The latter is now sole proprietor of the Empire Rubber Co., also of the Rubber Ring Manufacturing Co., of Leeds.

RUBBER MANUFACTURERS AND MOTOR SHOWS.

The New Motor & General Rubber Co., Limited, of London, has instituted legal proceedings against the Society of Motor Manufacturers & Traders, Limited, organizers of the International motor exhibitions at Olympia, claiming the right as members of the society to ballot for space at the exhibitions and asking an injunction to restrain the society from excluding them from such ballot, also damages for breach of agreement and for being denied the right to exhibit at the 1913 show. The defendant society makes a general denial of these claims. The plaintiff company joined the society in 1906. In 1907 the society's charter was changed, the new rules providing that only manufacturers or sole concessionaires of manufacturers of motor cars should thereafter be entitled to ordinary membership—no firm enjoying membership prior to the close of 1906 being included in this rule—all others to be associate members. The formation by the plaintiff company, in 1910, of Almagam, Limited, is held by the defendants to have terminated membership in the society, the clause relating to old members not applying.

Mr. Thomas Warwick, managing director of the New Motor company, is the inventor of "Almagam" and "Rubmetal," for tire repairing, both of which are manufactured by the Associated Rubber Manufacturers, Limited.

The Shipping, Engineering and Machinery Exhibition, which was to have been held in London during the fall of 1914, has been postponed, and is now scheduled to take place during the fall of the present year, at Olympia, London.

In the French armored cars, where the machine gun is mounted in a rotating turret with a flange resting on the edge of the circular aperture in the roof, a rubber ring is fitted under the flange to prevent movement of the turret during firing.

THE GERMAN RUBBER SITUATION AS GERMANS SEE IT.

[The following paragraphs are taken from a review of rubber conditions in Germany during the year 1914, which appeared in a recent issue of the "Gummi-Zeitung"]

THE year 1914 opened unfavorably for the German rubber industry, which, like other industries in Germany, was still suffering from the after-effects of the recent Balkan disturbances. But the German rubber industry was gradually righting itself, and adapting itself to the new conditions, and the outlook was much brighter when, suddenly, the great war broke out, paralyzing all industries, including the rubber trade.

The extraordinary decrease in prices of raw rubber, due to the flooding of the European market by unsold plantation rubber, had enabled German manufacturers to meet the general depression and even increase their output. The decrease in the value of manufactured goods produced by Germany was due to the decreased cost of raw materials. Business in surgical rubber articles was saved from a deplorable situation by the outbreak of war, which put it on its feet again. The unhealthy condition of this branch of the rubber industry was chiefly due to the laws prohibiting the sale of certain articles, and especially to the harsh interpretation of these laws by various courts, which included under the prohibition many articles having no connection with those aimed at by the laws. The surgical rubber business was also menaced by the tendency among consumers to trade direct with the manufacturers, and even to manufacture, themselves, for their own individual purposes. Then, doctors often purchased direct from the producers. To protect their interests, manufacturers and dealers in surgical rubber goods attempted to form a syndicate, but so far it has not been effective.

The electric cable industry, so closely allied to rubber, although it had made serious efforts to put its production on a profitable basis, was still suffering cruelly from English competition, and even being assailed from the ranks of the domestic rubber industry.

Another tendency the rubber industry had to contend with was the growing policy among consumers of purchasing for their immediate needs only. Orders were especially small from the building and furniture manufacturing lines. Even the electrical branch, which is usually prosperous, felt the general depression severely. The slight rainfall affected the business of rubber clothing and rubber shoe manufacturers. The German tire industry, which has suffered severely by the practice of allowing too generous guarantees, as well as from French and British competition, showed no tendency toward improvement. Then at the very commencement of the year labor organizations and socialists started a movement (which was partially successful) in favor of increased wages. On top of all this, extra burdens were placed on the shoulders of the German rubber industry by the "Clerks' Insurance Law."

The German rubber industry took an active part in four international expositions, and thus did its share in maintaining the reputation of German industry on foreign markets. Generally speaking the situation of the German rubber industry, though not bright, was improving and its members could look to the future with confidence, when the terrible war broke out, affecting all industry, including rubber. The general effect of the war was, naturally, to make conditions even worse than they were before. Those firms having government contracts to fill had all the work they could do, but this is not sufficient compensation for what they are losing through the war. The shutting off of nearly all means of communication, the closing of sea traffic, held back enormous quantities of goods ready for shipment, and caused great quantities of merchandise en route to be seized and confiscated. The exigencies of war created a shortage in skilled

labor, which further curtailed production when it did not paralyze it altogether.

Large concerns had a considerable supply of raw rubber on hand and, thanks to the embargo on rubber exports, an immediate rubber famine was not to be feared, but benzene, benzol and other solvents were not to be had in sufficient quantities. Manufacturers and dealers in toys and sporting goods, manufacturers devoting their efforts exclusively to foreign markets, were among those most severely affected by the war. Export trade was dead.

The rubber goods trade has been in a very bad condition since the war broke out. Most dealers had quantities of their merchandise in stock which, under present conditions, are no longer in demand. Few, if any, had any stock of articles which were in real demand. Many dealers were willing to pay increased prices to get deliveries and satisfy their customers, but quick deliveries were impossible. The outbreak of war was so sudden that no one foresaw it and no one had on hand the proper goods to meet the new demands. Of late matters have returned to a somewhat normal state. The government has recognized its mistake in taking too many hands away from industry.

As long as the war lasts it will be quite impossible to make any predictions, but it is already clear that the greatest loss to the German rubber industry is directly due to its total dependency upon foreign countries for its supplies in raw materials.

RUBBER FAMINE IN GERMANY.

The following statistics of rubber imports into Germany from England during the months between August and December, 1913, are of interest in forming an opinion of the rubber famine which is now affecting Germany. These months correspond, in 1913, with the first four months of the war.

GERMAN CRUDE RUBBER IMPORTS FROM ENGLAND IN 1913.

August	714
September	628
October	723
November	525
December	771
Total	3,411

German exports of rubber goods during the first seven months of 1914 (before the war began) were considerably larger than for same period in 1913.

RUBBER SUBSTITUTES IN GERMANY.

A German dealer in rubber goods writes to the "Gummi-Zeitung" concerning the development of the manufacture of articles from rubber substitutes, rendered necessary by war conditions in Germany. In his opinion the German nation, as well as German rubber manufacturers, should be most thankful to the inventors of rubber substitutes and to those who have been willing to devote their intelligence, energy and capital to the development of this new field.

It is owing solely to rubber substitutes, he states, that certain branches of the German rubber industry are able to satisfy their customers. Many technical articles, which formerly were only made of real rubber, are now manufactured from rubber substitutes. Quite a number of articles which, for one reason or another, cannot be made of rubber substitutes, are no longer to be obtained on the German market, there being no raw rubber available for their manufacture. This dealer advises customers not to be too particular about the appearance of substitute articles, which often do not look so well as real rubber. Manufacturers are doing their best. They will no doubt be able to improve upon their substitute articles, but they must be given time as this line is absolutely new for many of them. The great point to keep in mind is that men have been able to create practical substitutes and use them in manufacturing necessities.

He believes that rubber substitutes have come to stay, that they will continue to be sold after the war is over, and that

people should make up their minds to get accustomed to "war rubber" as they have to "war bread." Necessity forced "war bread" upon the population of Germany and it is very likely that it will be the same for "war rubber." People will get used to both and will continue to use both after the war is over.

GERMAN CABLE MANUFACTURERS FORM POOL.

German manufacturers of electric cables have formed an important syndicate combining all the large concerns engaged in this line of manufacture. The important firm of Brown, Boven and Co., which last year took over the J. Walken plant, at Cologne, and turned it into a cable factory, has joined the pool.

A RECENT EDITORIAL FROM A GERMAN TRADE JOURNAL.

An editorial paragraph from a recent issue of a German paper devoted to the bicycle and motor car trade runs as follows:

"Naturally, the war has paralyzed the activity of our industries and of our trade, but we should not paint the future too black. Quite aside from the purely humane point of view, which makes us wish for the end of all this suffering, our sincere wish for our commerce and our industries is that the present year may bring the end of the war and a happy and enduring peace. Of course, the future peace will not heal all wounds immediately, especially in the case of concerns engaged in export, but we confidently hope that, when the war ends, we will be able to find plenty of profitable work supplying the demands of the home market, replacing what has been destroyed by the war. In time the industries of the world will bloom again, and we hope that German industry and German export trade will get the share which heretofore they have obtained through their skill and energy. Our industries have been holding out through all these difficulties and they will hold out until the victorious end for which the armies and navies of Germany and Austria-Hungary, like ourselves, are fighting."

RUBBER CONDITIONS IN AUSTRIA.

A somewhat difficult situation has been brought about in the German rubber export trade to Austria. The war office has stopped the export of certain rubber goods from Germany to Austria, and Austrian manufacturers have therefore been thrown back on their own resources. Rubber bags and cushions and articles of this description are now manufactured in larger quantities, but a general shortage in rubber manufactured goods is expected very soon, as the Austrian government demands large supplies of tires from the manufacturers and compels them to give up any other manufacture but that of tires. The German rubber manufacturers, who have large stocks of all surgical rubber goods, are trying now to induce the German war office to lift the embargo on such goods as far as Austria is concerned.

GERMANY COULD HAVE USED "TROLIUS" CARGO.

In a recent newspaper article on the rubber trade and the war, Mr. John McEwan, chairman of the Rubber Growers' Association, commented on the sinking of the "Trolius," with her cargo, which included 1,300 tons of crude rubber, by the German cruiser "Emden." He pointed out what a help this quantity of rubber would have been in relieving the present German rubber famine if, instead of sinking it, the "Emden" had been able to seize it and get it to some port in Germany.

RUBBER PLANTATIONS IN GERMAN EAST AFRICA.

The rubber plantations in German East Africa, which were planted in 1913, are progressing satisfactorily although some of the older trees have been damaged by the winds and some destroyed by cryptogamous insects.

THE DUTCH EAST INDIES.

RUBBER STATISTICS PREPARED BY THE MEDAN CHAMBER OF COMMERCE.

ON July 1, 1914, the rubber plantations on the east coast of Sumatra covered 244,203 acres, of which 40,000 acres were producing. There were 3,305 planted acres in 1905; 73,826 in 1910, and 239,650 in 1913. In the Cap Tamiang district rubber cultivation was first undertaken in 1909, when 2,250 acres were planted. In 1913, 14,240 acres were under cultivation.

In 1913, 7,543,142 pounds of plantation rubber and 30,153 pounds of wild rubber were exported from the east coast. During the first six months of 1914 the exports from this coast amounted to 5,073,950 pounds. The greatest part of this rubber was shipped to London. Other ports to which shipments were made were Amsterdam, New York, Antwerp, Hamburg, Rotterdam, Havre and Bremen.

In 1913, the rubber plantations of the Malay Peninsula covered 708,545 acres and produced 61,971,800 pounds of rubber.

Dutch capital invested in rubber undertakings in the Dutch East Indies amounted in 1913 to \$26,753,301, while foreign capital similarly invested aggregated \$85,316,419, of which \$69,055,198 was issued.

Imports of plantation rubber into Holland increased from 10,560 pounds in 1907 to 218,020 pounds in 1910, to 1,866,700 pounds in 1912 and to 3,919,900 pounds in 1913. Meanwhile, imports of wild rubber showed only a slight increase, from 2,077,000 pounds in 1907 to 2,917,200 pounds in 1913. In the last 12 years imports of raw rubber into Holland have increased 100 per cent.

Increased quantities of rubber were exported from the Dutch East Indies to Japan in 1914, and were sold at fair prices compared with those obtained in that country for Para sheet; Para sheet bringing 1.20 yen [about 60 cents], and Bornco sheet 1.15 yen [about 57 cents].

DUTCH INDIES A FIELD FOR AMERICAN AUTOMOBILE TIRES.

Imports of automobiles and accessories by the Dutch East Indies show this market to be well worth the attention of the American manufacturers. Statistics for 1913 give the number of automobiles imported during that year at 1260, valued at \$1,638,000, of which 490 came from the Netherlands, American cars, of which 250 valued at \$250,000 were imported, coming second on the list. When it comes to tires, the American makes were very inadequately represented, only \$8,000 of the total tire imports of \$590,000 coming from the United States. At the close of the year, six different tires were represented in Java, of which but one was from the United States. The value of the American tires imported is thus entirely disproportionate to that of the cars from this country, and as the people of the Dutch East Indies are evidently quite deeply interested in the motor car, the market is one that it should pay American manufacturers to cultivate.

Mr. E. de Kruyff, representative of the Netherlands East India Government at the Panama-Pacific International Exposition, is interested in opening up direct trade relations between Netherlands East India and manufacturers in the United States. If addressed, in care of the Exposition, San Francisco, he will be glad to furnish manufacturers commercial information concerning the country he represents.

Tandjong Rubber Co., Limited, at the seventh annual general meeting reported 545,267 pounds of rubber harvested at an all-in cost of 1s. 4.42d. The gross selling price was 2s. 2.73d. The year's net profit was £24,176, 0s. 7d., making with £5,401, 12s. 7d. carried forward £29,577, 13s. 2d. available for distribution. It was proposed to pay a dividend of 8 per cent., place £10,000 to reserve and carry £7,577 13s. 2d. to next accounting. A crop of 780,000 pounds is the estimate for next year.

Some Rubber Planting Notes.

WHEN war broke out, followed by something like a panic in financial circles, the plantation industry of the Orient appeared to be in a very bad way. All communication between this country and the estates was, for the time being, suspended, and it was impossible to transmit funds. A little later, when cable intercourse was resumed, instructions were given to estate managers to cut down expenditures to a minimum, to take on no additional coolies and to discharge any who were not absolutely indispensable. In Malaya, particularly, the net result after six months of war has been greatly to modify the labor situation. Not only have the plantations reduced their forces but the tin mines as well, while the government has temporarily suspended a number of public works. Many coolies have been expatriated and immigration has been stopped, ostensibly because of the existence of smallpox at Negapatain. As a result, British Malaya now finds itself with about 40,000 less coolies than at the time of the outbreak of war.

Contrary to expectations, however, the rubber producing industry has suffered least of any through the European conflict. The commodity has continued in good demand and prices have been well maintained, even showing a tendency to advance. In the circumstances, the plantation companies are beginning to regret their hasty action with regard to labor and are already clamoring for the resumption of immigration. But it does not appear likely that the situation will be very quickly mended. So many European assistants on rubber estates have volunteered for the war that it is a question whether plantation staffs are at present in a position adequately to control and supervise large new groups of coolies.

The subject is of special importance because of its possible bearing upon the supply of plantation rubber. Under normal conditions about 20,000 tons additional might be expected from the Middle East this year; but if, through shortage of labor, it should be necessary to restrict tapping operations, estimates for 1915 may have to be considerably modified.

CAPITALIZATION OF RUBBER ESTATES.

One of the largest and best known producing companies, Linggi Plantations, after having paid more than 900 per cent. in dividends within 9 years, now finds it necessary to raise further capital. The sum required is £50,000, which it is proposed to raise by the issue of 100,000 shares of 2s each at the price of 10s. The market price of the existing shares is about 14s. In this way the capital account will only be increased by £10,000. Linggi Plantations has about 7,500 acres under rubber, of which some 3,000 acres are not yet in bearing. Last year the crop of rubber was 1,370,500 pounds, which compares with 1,132,500 pounds by the Highlands and Lowlands Co. It may interest our readers to know that the capitalization of the planted area of the Linggi property is £15 per acre. This means that if the average production all over were 400 pounds per acre and sold at a profit of only one penny per pound the company could still pay its shareholders 10 per cent. It may be added, however, that inasmuch as the company's 2s. shares are priced at over 14s., the share market capitalization is at the rate of nearly £110 per acre.

HEVEA IN COCHIN CHINA.

In Cochin-China there are about four million *Hevea Brasiliensis* trees planted on an area of about 32,500 acres. In 1913 Cochin-China exported 660,000 pounds of raw rubber as compared with 385,000 pounds exported in 1910. Practically all these exports go to France, principally to the ports of Havre and Bordeaux.

Statistics of exports from French Indo-China for 1913 show caoutchouc to the value of \$128,700 shipped through the port of Saigon and \$1,673 from Cambodia.

THE PLANTING OF MANIHOT GLAZIOVII ON THE MAYUMBA.

THE climatic and atmospheric conditions at Mayumba, in the French Congo, are particularly favorable to the planting of the *Manihot*, as the tree requires but little rain. The soil at Mayumba is composed of several different strata, which, notwithstanding that they are found over practically the whole district, are, however, of varying degrees of thickness, according to the structure of the ground. Underneath the top stratum a layer of flint is found, which is followed by a layer of rolling slate, sometimes thick enough to prevent the percolation of water. In some places the top stratum is so thin that the flint comes up to the surface. The region around Mayumba is for this



OLD TAPPING ON MANIHOT HALF-HERRINGBONE SYSTEM.
LOWER CONGO.

reason suitable for the planting and growing of *Manihot*, but experience seems to have shown that the lower parts of the district should be avoided, as the great humidity of the ground is dangerous to the roots of the younger plants.

The planting of *Manihot* in this region dates back only about ten years. Owing to its rapid growth and its small needs, the tree formerly found much favor. Later, however, it lost caste. The planters heard of the unsuccessful experiments in some parts of the Congo State—where the conditions were not favorable to the tree—and further grew discouraged because of injudicious and therefore ill required attempts at tapping. In consequence of this, many advised against the planting of *Manihot*, and in one case a large number of trees were cut down without the least attempt to save the rubber; and this at a time when rubber was selling at something like \$3 per kilogram—or nearly \$1.40 per pound.

After a period of neglect, *Manihot* found a champion in Mr. Jacquer, who made extensive experiments and secured a new and practical knife for tapping. He used the herringbone incision. Experience has shown that this is not the method best adapted for the tree, nevertheless, the results were so encouraging that he planted about 3,000,000 *Manihot* trees.

Notwithstanding its poor results, the fishbone method of tapping is still almost everywhere in use in this district. The preparation of the trees necessary for this method is not always

without danger to the tree, and it requires more ability and judgment than are usually found among the negro workmen. The result of this is that the trees are frequently ill treated, so that the incisions heal badly and the tissue of the bark suffers.

Other methods have been recommended in consequence, and the tapping procedure employed on the German plantation in Lewa is finding favor with planters. The results obtained by the Lewa method have been very promising, experience showing that the tree recovers quickly and that a second tapping gives still better results than the first.

Some plantations are growing *Manihot* directly from seed, planting the seeds directly in the future soil of the tree. This method, as a rule, produces very strong trees, though it is not always entirely successful. The larger plantations, however, are following the nursery system, later transplanting the stumps to their proper places. The trees are planted from 12 to 15 feet apart, which gives enough space for the branches. As a rule, the tops of the trees will touch in about four years. The trunks are then protected against the sun which is very important—and the gatherers can work during the whole day.

The plant *Cissus adenocaulis*, locally called at Mayumba "Lembugi," serves as an excellent medium for coagulation.

RUBBER EXPORTS FROM STRAITS SETTLEMENTS.

A cablegram from the Colonial Secretary to the Malay States Information Agency announces that the exports of rubber from the ports of the Straits Settlements for the month of December amounted to 2,334 tons, as compared with 2,370 tons in the preceding month and 1,217 tons in the corresponding month of 1913. The total exports for the year amounted to 19,727 tons, as compared with 11,889 tons in 1913 and 5,799 tons in 1912. The following are the comparative statistics for three years:

	1912.	1913.	1914.
January	253	784	1,181
February	274	743	1,703
March	427	898	1,285
April	387	762	1,548
May	431	814	1,309
June	398	812	1,480
July	380	1,120	1,584
August	729	1,315	1,325
September	597	1,057	1,602
October	550	1,144	2,006
November	816	1,223	2,370
December	557	1,217	2,334
Total	5,799	11,889	19,727

These figures include transshipments of rubber from various places in the neighborhood of the Straits Settlements, such as Borneo, Java, Sumatra and the non-Federated Malay States, as well as rubber actually exported from the Colony, but do not include rubber exports from the Federated Malay States.

FEDERATED MALAY STATES RUBBER EXPORTS.

An official cablegram to the Malay States Information Agency announces that the exports of rubber from the Federated Malay States for the month of January amounted to 3,473 tons, as compared with 2,542 tons for the corresponding month last year and 3,361 tons in December last.

The January export is the largest amount of plantation rubber yet recorded for one month by the Malay States.

Brooklands & Selangor Rubber Co., Limited, at its fourth annual meeting, received a report announcing profits for the period covered of nearly £5,000. The loss of a consignment of 3,000 pounds of rubber in the "Trolius," which was sunk by the "Emden," was reported. The estate was reported in good condition, all dues paid to date and production of rubber in progress.

Sengat Rubber Estate, Limited, reports a crop of 281,668 pounds of rubber, the original estimate having been 247,000 pounds. The cost f. o. b. was 9.63d. It was decided to pay a dividend of 1d. per share.

BALATA MONOPOLY IN DUTCH GUIANA.

By Our Regular Correspondent.

WITH few exceptions the inhabitants of Dutch Guiana, and more especially those engaged in the balata industry, are all up in arms against the ordinance just created by the government, which they claim favors the companies "Suriname" and "Guyana." These concerns have been amalgamated and hold most of the available large producing balata tracts.

A cablegram signed by leading men has been forwarded to the Minister of Colonies at the Hague which reads as follows:

"Balata industrials and others interested implore disapproval new balata ordinance. This ordinance will result only in interest of united companies 'Suriname' and 'Guyana' which will have exclusive right, obtaining best balata lands in very extensive area, creating monopoly, excluding other exploiters, to detriment colony and population. Petition follows."

A petition largely signed by influential members of the community followed the cable; but two days after the despatch to the Minister, the Governor received a wire from this high official to the effect that the new ordinance was accepted by the House and had passed its final reading.

The people, therefore, are indignant. The press, with only one exception, has taken the matter up and openly condemns the policy of the authorities. The attitude of the papers is most threatening, and it is openly asserted that trouble will soon follow this incident.

It is, however, quite clear that the amalgamated concerns have the best of the deal, and it is stated that they are negotiating a loan in the United States to operate the lands which they now hold, covering all the available balata forests in the colony.

There is no getting away from the fact that as far as the balata industry is concerned the only people in the colony to derive any benefits from the exploitation of this enterprise are those who are directly associated with the companies in question.

RUBBER EXPORTS FROM TRINIDAD.

The following table shows the shipments of rubber from Trinidad for the year just past, as contained in the "Proceedings of the Agricultural Society of Trinidad and Tobago":

January to November, inclusive.....	pounds	3,845
December		797
Total shipments in 1914.....		4,642
Total shipments in 1913.....		6,454
Total shipments in 1912.....		6,736

A NEW STEAMSHIP LINE TO SOUTH AMERICA.

Steamship service is soon to be established between New York and the east coast of South America, Norton, Lilly & Co., Produce Exchange, New York, having secured the steamer "Crofton Hall" for operation between New York, Montevideo and Buenos Aires, carrying freight and passengers. The "Crofton Hall," whose initial trip in this service will be made March 1, was built in 1913, with all modern passenger conveniences, and is the only American passenger steamer going direct to the east coast of South America.

The Department of State of the Republic of Cuba requests catalogs and samples of articles of rubber, gutta percha, etc., together with cable address of the manufacturer, trademarks and other information for exhibition in a "commercial museum" attached to its Bureau of Information. These may be sent direct, addressed to Sr. Secretario de Estado, Habana, Cuba, or to the Cuban consulate general, 82 Beaver street, New York.

Should be on every rubber man's desk—Crude Rubber and Compounding Ingredients; Rubber Country of the Amazon; Rubber Trade Directory of the World.

AMAZON TRADE CONDITIONS.

By Miguel P. Shelley, of Para.

ACCORDING to the latest statistics, Brazil during the fiscal year 1914 imported goods to the value of \$308,409,000. Of this amount, imports from the United States only amounted to \$29,963,914; while, on the other hand, the United States imported from Brazil merchandise—chiefly crude rubber and coffee—to the value of \$101,329,073.

Referring to the Amazon country alone, the exports of rubber and cacho from that district for the year 1913 were as follows:

	United States	England	France	Other Countries	Total
From Para	\$8,267,145	\$8,778,145	\$1,838,431	\$10,000	\$29,097,791
From Manaus	7,329,500	6,046,699	1,873,001	466,616	16,615,806
Total	\$16,391,695	\$15,724,834	\$3,711,432	\$985,616	\$36,713,597

With regard to the imports into the Amazon district, separate reliable figures do not exist, but they import only those things from the United States that are absolutely necessary, such as kerosene oil, flour, lard and a little machinery, or other articles which they cannot obtain from England, Germany or France, notwithstanding the fact that America is nearer to the Amazon than any of those countries.

Why does American trade with Brazil lag so far behind? The table of Amazonian exports indicates that the United States is importing about 40 per cent. of the total—mainly crude rubber. But in reality it is using 60 per cent. of this crude rubber. The additional 20 per cent. is reimported from England after England has imported it from the Amazon. The main reason for this paradox is the use of letters of credit issued by English banks in financing the operations of American importers. An additional factor is the ready shipping facilities that the English merchants have.

The freightage from Brazil through England to the United States is often less than to the United States direct. This is rendered possible by the deplorable lack of an American merchant marine.

BANKING PROCEDURE IN BRAZIL.

Let us now enter upon a more explicit understanding of the situation. Let me explain in detail the real system by which exportation and importation are carried on, and thereby disclose the real cause for the failure of the United States to participate properly in the Brazilian trade.

Rubber, cocoa and Brazil nuts, the principal products exported, are sent from the interior to the two central markets and shipping ports—Para and Manaus. There they are bought by a few houses, namely, Zarges, Berringer & Co. (German and English), De Lagotellerie & Cie (French), Adolbert H. Alden and the General Rubber Co. (American), Suarez Hermanos (English), and J. Marques, Pires Teixeira & Co. and Pralow & Co. (local). These firms ship the rubber to its destination, drawing against the shipments. This draft is made out in pounds sterling. Even American dealers have to accept the drafts in pounds, although they are buying them in dollars. This is the whole drawback in the situation. Since there is no American bank in the Amazon country, but only English, namely, London & River Plate Bank, Limited, London & Brazilian Bank, Limited, and the British Bank of South America, the Amazonian dealer has no other choice in selling his drafts. This triple exchange from Brazilian currency to pounds sterling and from this to dollars, and the consequent banker's commissions, of course render the merchandise dearer for the American than for the English. The financing of imports is similarly affected. Add to this the fact that the importer is less versed in business methods than the exporter, one can readily see that the six exchanges in his drafts weary and trouble him so that he is glad to have nothing to do with American imports.

The English banks operating in Brazil, according to the statistics of 1906, cleared profits aggregating the not inconsider-

able sum of £1,271,611, or about \$6,180,023 in American gold.

The manufacturer, instead of being directly in contact with the producer, buys his rubber from the dealer, who, taking advantage of the situation, speculates with this rubber. The dealer buys it in advance very cheaply, to sell at a high price when the manufacturer needs it.

An American bank would make it possible for rubber transactions to take place directly between the producer and the consumer. Besides relieving the export articles of their great burden, the middlemen's profits—which are not less than 8 per cent.—and American financing would bring the whole rubber trade to the United States. It would also do away with the speculation existing now in the rubber trade, which is so harmful to the manufacturer as well as to the producer. The organized co-operation of the manufacturers on one side and the producers on the other, would consolidate the rubber business. But it must have the American bank's financing first.

The importation of goods to the Amazon from England and Germany is due chiefly to the existence of British banks, there for the English trade, and to German special agencies for the German trade. The collection of bills for merchandise bought from all nations of the world, including the United States, is carried on by the English banks in pounds sterling. Consequently, besides the profits from exchange, England dominates the Brazilian market. The English banks keep a good record of all the business transactions made with Brazil so that they may be able to advise all who are employing their capital there and who wish to do so.

THE NEED OF EFFECTIVE ADVERTISING PROPAGANDA.

Besides the lack of banking and shipping facilities and the confusion of the credit system, there is still another cause for the failure of American trade in Brazil. This is the ineffectual propaganda. The greatest portion of the advertising matter sent to Brazil is in the Spanish language, and it is sent to some of the dealers in the big cities. In the first place, Portuguese, not Spanish, is used in Brazil, and the two languages have about as much relationship as Dutch and German. Secondly, it is not the dealers that need the propaganda. They require a demand for the goods they handle. This demand you must create among the consumers. For this reason the Germans are far ahead even of the English, who dominate in the main through their banks. Every commercial center has a German agency which is capable of giving full information to consumer, dealer and manufacturer. These distribute pamphlets, circulars and general literature of German goods in exactly those quarters where it is needed. They advertise the goods in the local papers. They also have a very clear knowledge of the credit system and can furnish full information in this connection to any German merchant who requires it. This applies to all South American countries.

As an effective means of promoting United States trade in Brazil, and especially on the Amazon, I would suggest to the American Manufacturers' Export Association that they create a department or a separate corporation which should come in contact directly with the rubber producer. The same association could promote the establishment of an American bank, which should take charge of the collections for the goods sold and buy the drafts of the goods bought.

In order to have all the information required by the producer and the consumer, I would suggest the co-operation of the United States government, which is showing great interest now in foreign trade by sending out agents and issuing a daily commercial bulletin. The American consuls are furnishing reports, but they are quite inadequate, since the consuls have no time to do this work; and besides, it requires a local man who is acquainted with local conditions. My idea is that every consulate should have a commercial department, managed by a local business expert, on a salary or commission basis.

Recent Patents Relating to Rubber.

UNITED STATES OF AMERICA.

ISSUED JANUARY 5, 1915.

- N** 1,123,396. Fountain syringe. I. E. Pease, Tufts College, Mass.
 1,123,375. Tire fabric. H. K. Raymond, Akron, Ohio, assignor to The B. F. Goodrich Co., New York.
 1,123,563. Leather sole with rubber plugs. A. F. Durgin, Haverhill, Mass.
 1,123,570. Combined toy and physical culture apparatus, containing elastic cord. E. Sandow, London, England.
 1,123,698. Composite outer sole. H. F. Crawford, assignor to C. & S. Rubber Sole Co.—both of Brockton, Mass.
 1,123,875. Spring wheel comprising an outer elastic tread. J. L. Heymann, Fayetteville, Tenn.
 1,123,912. Life saving suit. F. A. McBlitt, Chicago, Ill.
 1,123,941. Detachable rubber heel. S. L. Sniderman, assignor to Independent Button Fastener Machine Co.—both of Boston, Mass.
 1,124,062. Heel plate comprising a strip of soft rubber. H. G. Robinson, Oakland, Cal.
 1,124,190. Rubber sole rolling machine. E. E. Winkley, Lynn, Mass.

Trade Marks.

- 77,297. J. Wallace, New York. The word *Inksgraph*. For fountain pens.
 80,455. Brooklyn Shield & Rubber Co., New York. The words *Le Roy*. For dress shields.
 82,561. The Icy Hot Water Bottle Co., Cincinnati, Ohio. The word *Comfy*. For hot water bottles of metal and other materials.

ISSUED JANUARY 12, 1915.

- 1,124,302. Rubber covered metal article and method of making the same. L. Draft, Rutherford, N. J., assignor to Electro-Chemical Rubber & Manufacturing Co., a corporation of New Jersey.
 1,124,381. Collapsible core. A. Adamson, Akron, Ohio.
 1,124,412. Fabric tension governor for tire making machines. J. R. Gammetter, Akron, Ohio, assignor to The B. F. Goodrich Co., New York.
 1,124,439. Resilient vehicle tire. C. E. Hoops, Kansas City, Mo.
 1,124,472. Breath guard. R. J. Lemonds, Livingston, Ky.
 1,124,480. Carrier for branding machines. A. Littlefield, assignor to New England Butt Co.—both of Providence, R. I.
 1,124,705. Pneumatic tire. J. H. Clune, Springfield, Mass.
 1,124,719. Gutter. J. T. Crowley, assignor to The Beacon Falls Rubber Shoe Co.—both of Beacon Falls, Conn.
 1,124,753. Armored pneumatic tire. C. W. Levalley, Milwaukee, Wis.
 1,124,884. Steaming device comprising a brush with hose attached. H. Gemignani, Pittsburgh, Pa.
 1,124,887. Swimmer's attachment. R. C. Grady, Bath, Me.
 1,124,920. Process of reclaiming rubber. H. W. Kugler, assignor to the Firestone Tire & Rubber Co.—both of Akron, Ohio.
 1,124,936. Smoking pipe tester comprising a rubber bulb. M. May, New York, N. Y.
 1,124,988. Rubber heel and sole. O. R. Witter, Swampscott, Mass.
 1,125,019. Elastic heel protector. E. Haaf, Donaueschingen, Germany.

Trade Marks.

- 79,974. Lacey File & Hardware Co., Philadelphia, Pa. Representation of an inverted tack. For rubber files.
 81,510. The Philip Carey Manufacturing Co., Lakeland, Ohio. The word *Century*. For rubber roofing.
 82,183. The National Belting Co., Elyria, Ohio. The words *Bee Dee*. For rubber and fabric beltings.
 82,381. The National Tire & Rubber Co., East Palestine, Ohio. The words *Natural Highway*. For automobile tire casings and tire tubes.
 82,579. Clauson Shoe Co., Rutland, Vt. The words *Arch-Rite*. For rubbers, boots, etc.
 83,114. A. W. Faber, Stein, near Nurnberg, Germany. The word *Omar*. For rubber pencils, rubber erasers, etc.

ISSUED JANUARY 19, 1915.

- 1,125,129. Inner tube for automobile tires. G. Kush, New York.
 1,125,134. Sponge rubber insole and arch support. J. D. Lee, Cleburne, Tex.
 1,125,276. Steam vulcanizer. J. O. Drew, Mason, Mich.
 1,125,303. Method of producing beads for tires. J. R. Gammetter, Akron, Ohio, assignor to The B. F. Goodrich Co., New York.
 1,125,431. Collapsible core. A. Adams, Akron, Ohio.
 1,125,470. Fountain pen filling device. H. N. Carpenter, Woodford, Vt.
 1,125,532. Apparatus for use in etherizing anesthetics. A. Humphries, Napier, New Zealand.
 1,125,559. Cushion horse-shoe. W. J. Kott, New York.
 1,125,577. Apparatus for treating rubber. L. C. Warner, Naugatuck, assignor to The Beacon Falls Rubber Shoe Co., Beacon Falls—both in Connecticut.
 1,125,578. Self-inflating tire. J. Fernandez, Houston, Tex.
 1,125,579. Resilient wheel. W. Trabue, assignor to Pneumatic Hub Tire Wheel Co.—both of Louisville, Ky.

Trade Marks.

- 77,147. J. Kott, Pittsburgh, Pa. The word *Circractor*. For boots and shoes made of rubber.
 82,588. W. Phillips, San Francisco, Cal. Representation of a runner with the word *Marathon*. For rubber heels and soles.

ISSUED JANUARY 26, 1915.

- 1,125,989. Arch support. E. J. Emery, Portsmouth, N. H.
 1,125,993. Rubber soled shoe. A. J. B. Faure, Paris, France.
 1,126,051. Device for use in playing golf. J. T. McGillicuddy, Worcester, Mass.
 1,126,232. Wheel tire. F. D. Lane, assignor to Bisbee Straight Motion Engine Co.—both of Bisbee, Ariz.
 1,126,327. Apparatus for treating latex. H. A. Wickham, London, England.
 1,126,366. Bust reducer. J. M. Bodensiek, assignor of one third to G. O. Bodensiek—both of New York, and one-third to F. Brooker, Brooklyn, N. Y.
 1,126,367. Hip reducer. J. M. Bodensiek, assignor of one third to G. O. Bodensiek—both of New York, and one-third to F. Brooker, Brooklyn, N. Y.
 1,126,458. Shoe sole. N. H. Hassel, Los Angeles, Cal.
 1,126,469. Vulcanization of rubber and production of vulcanized rubber products. F. Hofmann and K. Gottlob, Elberfeld, Germany, assignors to Synthetic Patents Co., Inc., New York.
 1,126,601. Water bag. R. B. Whitmarsh, Los Angeles, Cal.
 1,126,648. Wear resisting laminated fabric for tires, etc. I. R. Y. Marble, Newport, R. I.

Design.

- 46,884. Core for vehicle tire. J. A. MacMillan, Dayton, Ohio.

Trade Marks.

- 79,239. Boonton Rubber Manufacturing Co., Boonton, N. J. The words *Hi Tensit*. For distributor insulators for magnetos for ignition systems.
 82,431. The Sterling Gum Co., Inc., New York. The word *Fruito*. For chewing gum.
 82,449. J. A. Riggi, Brooklyn, N. Y. The word *Lamchew*. For chewing gum.
 83,081. J. Ullrich, New York. Representation of a lady's head on an ink pencil with the words "*American Maid and Vulcan*." For fountain pens and ink pencils.
 83,241. Clark Rubber Manufacturing Co., Franklin, Mass. The word *Comporub*. For soles and heels of shoes.
 83,407. Continental Rubber Works, Erie, Pa. The word *Italac*. For rubber matting, stair treads, hospital sheeting, etc.
 83,592. Powell & Campbell, New York. Diamond design with initials *P* and *C*. For boots, shoes and rubbers.
 83,636. The B. F. Goodrich Co., New York. The word *Ikonic*. For rain coats.

[NOTE.—Printed copies of specifications of United States patents may be obtained from THE INDIA RUBBER WORLD office at 10 cents each, postpaid.]

GREAT BRITAIN AND IRELAND.

PATENT SPECIFICATIONS PUBLISHED.

The number given is that assigned to the Patent at the filing of the application, which in the case of these listed below was in 1913.

*Denotes Patents for American Inventions.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, JANUARY 6, 1915.]

- 20,205 (1913). Spring wheel with continuous outer rigid ring and pneumatic cushion. F. F. Ganly, 153, Accomb street, Rusholme, Manchester.
 20,242 (1913). Abdominal belt. C. U. F. West, Sydney House, The Beeches, near Slough, Bucks.
 *20,350 (1913). Bath with rubber lining. E. A. M. Gallagher, Gouverneur Hospital, New York, U. S. A.
 20,448 (1913). Vehicle wind screen with rubber strap. G. T. Whitman, 69, Cavendish Building, Clerkenwell, and A. C. Dulcken, 30, Mincing Lane, E. C.—both in London.
 20,461 (1913). Puncture preventing layers of metallic wire gauze and rubber canvas. S. Lyle, 6, Royal Oak Walk, Pitfield street, London.

- 20,471 (1913). Apparatus for coating fabrics with rubber. W. A. Higham, Turners Hill, Chestnut, Essex, and H. Skelton, 175, Gt. Dover street, Southwark, London.
 20,643 (1913). Rubber coated fabric. J. T. Szek, 36, Rue de la Victoire, Brussels.
 20,656 (1913). Breathing apparatus. R. H. Davis, 187, Westminster Bridge Road, London.
 20,722 (1913). Rubber inlaid floor coverings. E. A. Beldam and W. R. Beldam (trading as R. Beldam), 1A, New London street, London.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, JANUARY 13, 1915.]

- 20,753 (1913). Rubber and metal plate for boots. D. J. Wilcock, 308, Ashton New Road, Bewick, Manchester.
 20,763 (1913). Tobacco pipe with vulcanite trap chamber. M. Bilton, 28, Kingswood avenue, West Kilburn, London.
 *20,913 (1913). Splints. E. D. Brant, Canton, Ohio, U. S. A.
 21,001 (1913). Calendering or mixing india rubber, etc. C. H. Gao, India Rubber Works, Silvertown, Essex.
 21,060 (1913). Tourniquet comprising a pad of vulcanite. J. M. Carvell, 31, Avonmore Road, West Kensington, London; W. G. Chapman, The Greenway, Uxbridge, and J. J. Staplehorn, 99, Third avenue, Queen's Park, London, W.

- 21,098 (1913). Respirator comprising a face mask with pneumatic rim. J. F. Scott, Caxton Cottage, and H. Davenport, Fairmount—both in Cannock, Staffordshire.
- 21,122 (1913). Tire cover of rubber with strips of cane or like fibrous elastic material extending obliquely from edge to edge. A. Anderson, Garden Road, Dunstable, Bedfordshire.
- 21,146 (1913). Vehicle window comprising rubber weather strip. M. Rey, 52, Rue de Passy, Paris, and J. de Wyckoff, 64, Victoria street, Westminster.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, JANUARY 20, 1915.]

- 10,487 (1913). Vulcanite saliva chamber for tobacco pipe, etc. G. N. Travers, 32, Charing Cross, Whitehall, London.
- 21,494 (1913). Athletic shoe with sole composed of fabric impregnated with balata, gutta percha, rubber or caoutchouc. I. Frankenburg & Sons, S. Frankenburg and F. H. Betteridge, Greengate Rubber Works, Salford, Lancashire.
- 21,654 (1913). Air tubes for wheel tire. F. Rich, High street, Crawley, Sussex.
- 21,675 (1913). Spring wheel with rubber ring and like cushion. J. Reuse and C. Reuse, 28, Quai au Charbon, Hal, Belgium.
- 21,771 (1913). India rubber. F. Ripeau, 10, Rue Rodier, Paris.
- 21,886 (1913). Dampener comprising two rubber covered rollers, in ironing apparatus. J. B. Russell and T. Wardrop, 11, Pritchard street, Charles street, Manchester.
- 21,909 (1913). Wheel tire. R. Wapshare, Westward Ho, Bangalore, Southern India.
- 21,986 (1913). Painting golf balls. B. Creswick, 22, Lansdowne Road, Erdington, Birmingham.
- 22,008 (1913). Cutting machine for rubber, etc. J. Rushmer, 344, Durnsford Road, Wimbledon Park, and H. Skelton, 175, Great Dover street, Southwark—both in London.
- 22,034 (1913). Pressure gage, the surface of which is formed of a rubber sheet. J. E. Graham, Fritwell Lodge, Banbury, Oxfordshire.
- 22,065 (1913). Waterproof fabrics for pneumatic tires, balloon envelopes, etc. L. Liais, 164, Rue de la Pompe, Paris.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, JANUARY 27, 1915.]

- 22,079 (1913). Rubber packing to secure wind screens to frames. J. W. Riding, "Willoughby," Dartmouth Road, ChorltoncumHardy, Manchester, and H. Grice, Hope Works, Sherborne street, Birmingham.
- *22,112 (1913). Improvements in solid rubber tires. W. H. Fahrney, 38 South Dearborn street, Chicago, Ill., U. S. A.
- 22,137 (1913). Caoutchouc substances. F. E. Matthews and E. H. Strange—both of 50, City Road, London.
- 22,152 (1913). Rubber heel lifts. Soc. Francaise du Cuir Armé (Soc. Anon), 118, Rue de Vaugirard, Paris.
- 22,302 (1913). Coagulating rubber. F. W. Manson, 36, New Broad street, London.
- 22,349 (1913). Wheel tire. R. Wapshare, Westward Ho, Bangalore, Southern India.

THE FRENCH REPUBLIC.

PATENTS ISSUED (with Dates of Application).

- 473,025 (June 4, 1914). Improvements in retreading pneumatic tires. F. W. Farr.
- 473,085 (September 6, 1913). A heel made of leather and rubber. Société Française du Cuir Armé.
- 473,275 (June 10, 1914). Improved elastic tire for vehicle wheels. E. F. Krell.
- 473,298 (June 11). Improvements to elastic wheels. J. W. Clifton.
- 473,303 (September 16, 1913). Puncture-proof protector for pneumatic tires. R. Labitte.
- 473,370 (June 12, 1914). Elastic wheel. Société R. F. P., Patent Wheels Proprietary, Limited.
- 473,417 (June 13). Improvement in vehicle wheels. C. O. Vantreau.
- 473,422 (June 13). New product for the manufacture of pneumatic and solid tires, shoes, soles, heels, etc. C. Parchetti.
- 473,462 (March 2). Machine for setting and fixing rivets in tires and tire shoes and for similar purposes. The Dunlop Rubber Co., Limited.
- 473,483 (May 13). Elastic wheel suspension with a compressed air chamber between the spindles of the wheels and the body of the vehicle. A. D. Tandarjian and R. Capitchi.
- 473,538 (September 29, 1913). Air tube for pneumatic tires, and process for its manufacture and repair. Société Foucher & Cie.
- 473,540 (September 29). Pneumatic tire for heavy vehicles. R. Lance.
- 473,546 (June 16, 1914). Improvements in pneumatic tire coverings and tire shoes. M. C. Overman.
- 473,582 (May 20). Improvements in pneumatic tire air tubes. J. W. Bladgett.

GERMAN EMPIRE.

PATENTS ISSUED (with Dates of Validity).

- 282,051 (January 13, 1914). Machine for placing a new tread on worn pneumatic tires for motor vehicle. Franz Kühne, Alaunstrasse, 13, Dresden.
- 282,052 (November 29). Tread for pneumatic tires. Oscar Mussinan, New York, U. S. A.; represented by Paul Müller, patent lawyer, Berlin S. W. 11.
- 281,989 (April 10, 1913). Belt lacing machine. Wilhelm Grupe and Hermann von der Heide, of Hameln, Klütstrasse, 36.
- 282,128 (July 12). Fluoric acid retainer. Doctor Heinrich Traun & Sons, formerly The Hamburg Rubber Comb Co., Hamburg.

RUBBER STATISTICS FOR THE UNITED STATES.

IMPORTS OF RUBBER AND MANUFACTURES OF.

ARTICLES.	December, 1914.		Twelve Months Ending December, 1914.	
	Quantity.	Value.	Quantity.	Value.
India rubber, etc., and substitutes for, and manufactures of:				
Unmanufactured—				
Balata <i>pounds, free</i>	200,002	\$74,712	2,015,158	\$880,214
Guayule gum	742,169	215,904	2,275,540	789,560
Gutta jelutong	1,192,567	50,787	18,663,898	856,976
Gutta percha	46,461	9,564	1,923,138	332,128
India rubber	583,797	5,138,953	143,065,161	79,472,704
India rubber scrap or refuse, fit only for remanufacture	889,613	28,975	19,118,966	1,356,750
Total unmanufactured		\$5,518,895		\$74,693,332
Manufactures of—				
Gutta percha <i>dutiable</i>		\$2,928		\$2,5403
India rubber		79,627		1,389,959
Total manufactures of		\$82,555		\$1,415,362
Substitutes, elasticon and similar		\$1,323		\$62,995

IMPORTS OF CRUDE RUBBER BY COUNTRIES.

From:				
Belgium			9,018,596	\$5,028,504
France	70,864	\$24,115	2,178,111	923,396
Germany			4,631,589	2,336,218
Portugal	702,969	207,267	1,928,175	573,580
United Kingdom	243,889	127,459	50,944,518	29,048,758
Central American States and British Honduras	12,092	4,333	442,160	205,185
Mexico	154,811	75,502	1,404,659	563,655
Brazil	6,341,650	2,882,395	44,686,093	17,822,396
Other South America	190,861	82,874	2,984,119	1,206,493
East Indies	3,724,801	1,675,564	22,989,691	11,758,517
Other countries	141,860	59,444	1,857,450	1,006,002
Total	11,583,797	\$5,138,953	143,065,161	\$70,472,704

EXPORTS OF AMERICAN RUBBER GOODS

India rubber, manufactures of:				
Scrap and old <i>pounds</i>	114,986	\$12,916	4,186,687	\$408,978
Reclaimed	538,877	68,776	6,250,491	872,398
Belting, hose and packing		103,666		2,098,506
Boots and shoes—				
Boots	52,401	113,667	262,295	616,602
Shoes	472,592	750,326	1,675,856	1,402,503
Tires—				
For automobiles		300,896		3,315,116
For other		32,592		452,882
All other manufactures of		226,406		3,016,098
Total		\$1,609,245		\$12,183,083

EXPORTS OF AUTOMOBILE TIRES BY COUNTRIES.

India rubber, manufactures of:				
Tires for automobiles—				
Belgium				\$301
Germany				\$1,917
England		\$182,852		1,458,777
Canada		14,526		\$66,999
Mexico		6,341		76,581
Philippine Islands		16,366		156,235
Other countries		80,811		674,306
Total		\$300,896		\$3,315,116

EXPORTS OF FOREIGN MERCHANDISE

India rubber, etc., and substitutes for, and manufactures of:				
Unmanufactured—				
Balata <i>pounds, free</i>	147,051	\$46,583	577,447	\$48,910
Guayule gum			2,750	1,058
Gutta percha			11,163	5,653
India rubber	628,248	306,836	5,865,016	3,744,346
India rubber scrap or refuse, fit only for remanufacture			324	8
Total unmanufactured		\$353,419		\$3,499,975
Manufactures of—				
India rubber <i>dutiable</i>		\$1,200		\$6,102
Substitutes, elasticon and similar		\$1,200		\$6,102

TELEPHONING THROUGH THE NECK.

By use of a recent adaptation of the telephone it is now possible for a man doing rescue work in a mine filled with poisonous gases or smoke to employ the mouth solely for breathing—by the aid of an oxygen helmet or other breathing apparatus—and yet communicate with those above by means of the telephone. The transmitter is fastened against the throat and the play of the vocal organs enables one really to talk through his neck and communicate without difficulty with those on the other end of the wire.

Official India Rubber Statistics for the United States.

Fiscal Year Ended June 30, 1914.

INDIA RUBBER.

IMPORTS OF CRUDE INDIA RUBBER, BY COUNTRIES.

FROM—	POUNDS.	VALUE.
Bolivia	11,095,246	\$6,481,901
British Honduras	56,992,877	1,124,629
Guatemala	7,092,767	3,595,369
Italy	3,881	1,589
Netherlands	1,016,441	1,134,060
Portugal	887,500	177,687
United Kingdom	48,279,619	31,152,311
Switzerland	43	25
Total	71,543,861	\$43,667,371

North America:

British Honduras	56,992,877	\$4,635
Canada	159,868	117,936
Central American States—		
Costa Rica	58,534	28,733
Guatemala	31,235	16,426
Honduras	37,607	19,371
Nicaragua	307,427	171,325
Panama	110,561	53,723
Salvador	6,640	3,641
Mexico	641,019	333,422
Total	1,365,803	\$749,111

South America:

Brazil	40,641,305	\$16,319,048
Colombia	382,003	178,870
Ecuador	214,383	75,941
Dutch Guiana	17	12
Peru	1,016,566	427,002
Venezuela	232,051	128,063
Total	42,486,727	\$17,125,936

Asia:

East Indies—		
British	7,236	\$3,360
Straits Settlements	9,035,503	5,122,318
Orch British	7,091,146	4,263,594
Dutch	463,220	286,437
Total	16,597,105	\$9,675,709

Oceania:

Philippine Islands	2,246	\$1,523
Total	2,246	\$1,523

IMPORTS OF MANUFACTURES OF INDIA RUBBER, BY COUNTRIES.

Figures in parentheses indicate decrease compared with the preceding year.

FROM—	POUNDS.	VALUE.
Europe:		
Austria-Hungary	84,064	\$4,064
Belgium	3,394	3,394
Denmark	4	4
France	1,368	1,368
Germany	60,941	60,941
Italy	6,938	6,938
Netherlands	38	38
Norway	7	7
Russia in Europe	149,866	149,866
Spain	140	140
Sweden	18	18
Switzerland	575	575
Turkey in Europe	48	48
United Kingdom	9,6612	9,6612
Switzerland	151,848	151,848
Total	229	229
Total	\$1,479,368	\$1,479,368

FROM—	POUNDS.	VALUE.
North America:		
Bolivia	\$9	\$9
Canada	36,595	36,595
Mexico	100	100
British West Indies	25	25
Central America	10	10
Total	\$36,739	\$36,739

FROM—	POUNDS.	VALUE.
South America:		
Venezuela	212	\$150
Total	212	\$150

FROM—	POUNDS.	VALUE.
Asia:		
Aden	60	\$10
East Indies—		
Straits Settlements	1,550,131	191,850
Dutch	33,965	3,159
Total	1,584,156	\$195,019

FROM—	POUNDS.	VALUE.
Europe:		
Total, 1913-14	1,846,109	\$323,567
Total, 1912-13	480,853	167,313
Total, 1911-12	1,204,406	225,797
Total, 1910-11	1,648,921	390,548
Total, 1909-10	784,501	167,873
Total, 1908-09	255,559	82,136
Total, 1907-08	188,610	100,305
Total, 1906-07	546,890	201,339
Total, 1905-06	500,770	188,161
Total, 1904-05	665,217	210,188
Total, 1903-04	424,617	174,953
Total, 1902-03	316,290	222,400
Total, 1901-02	525,767	252,329
Total, 1900-01	280,560	130,957
Total, 1899-00	427,678	178,616
Total, 1898-99	518,939	167,577
Total, 1897-98	636,477	159,381
Total, 1896-97	1,117,665	100,187
Total, 1895-96	3,843,854	178,513
Total, 1894-95	1,326,794	122,261
Total, 1893-94	498,763	84,340
Total, 1892-93	582,378	155,428
Total, 1891-92	308,239	114,874
Total, 1890-91	960,835	164,524

RE-EXPORTS OF IMPORTED INDIA RUBBER.

TO—	POUNDS.	VALUE.
Belgium	12,139	\$6,203
France	131,016	90,048
Germany	201,757	96,045
Spain	2,548	1,274
United Kingdom—		
England	141,229	\$3,745
Scotland	72,247	50,889
Canada	3,179,489	2,064,712
Brazil	1,143	834
Japan	6,181	4,400

TO—	POUNDS.	VALUE.
Total, 1913-14	3,747,749	\$2,398,150
Total, 1912-13	5,272,387	4,476,379
Total, 1911-12	5,610,951	4,890,905
Total, 1910-11	5,267,588	5,439,282
Total, 1909-10	6,492,947	7,629,380
Total, 1908-09	3,791,971	2,964,496
Total, 1907-08	4,110,667	2,994,208
Total, 1906-07	4,215,350	3,593,912

RE-EXPORTS OF MANUFACTURES OF INDIA RUBBER.

TO—	POUNDS.	VALUE.
Austria-Hungary	160	\$160
Belgium	625	625
France	579	579
Germany	1,985	1,985
Netherlands	1,700	1,700
United Kingdom—England	78	78
Canada	2,298	2,298
Mexico	188	188
West Indies—Cuba	85	85
Total, 1913-14	7,638	\$7,638
Total, 1912-13	7,973	7,973
Total, 1911-12	6,681	6,681
Total, 1910-11	29,356	29,356
Total, 1909-10	13,568	13,568
Total, 1908-09	36,401	36,401
Total, 1907-08	176,129	176,129
Total, 1906-07	32,712	32,712

GUTTA PERCHA.

IMPORTS OF CRUDE GUTTA PERCHA, BY COUNTRIES.

FROM—	POUNDS.	VALUE.
Europe:		
France	16,76	\$5,607
Germany	174,27	107,068
United Kingdom—		
England	63,508	13,182
Scotland	124	436
Total	253,935	\$126,233

FROM—	POUNDS.	VALUE.
North America:		
Canada	5,074	\$1,304
Bolivia	2,732	861
Total	7,806	\$2,165

FROM—	POUNDS.	VALUE.
South America:		
Venezuela	212	\$150
Total	212	\$150

FROM—	POUNDS.	VALUE.
Asia:		
Aden	60	\$10
East Indies—		
Straits Settlements	1,550,131	191,850
Dutch	33,965	3,159
Total	1,584,156	\$195,019

IMPORTS OF MANUFACTURES OF GUTTA PERCHA, BY COUNTRIES.

FROM—	POUNDS.	VALUE.
Europe:		
Austria-Hungary	7	\$484
Belgium	5	5
Denmark	5	5
France	824	824
Germany	27,627	27,627
Russia in Europe	2,464	2,464
United Kingdom—		
England	4,837	4,837
Scotland	3,460	3,460
Total	39,708	\$39,708

FROM—	POUNDS.	VALUE.
North America:		
Canada	2,311	\$2,311
Mexico	4	4
Total	2,315	\$2,315

FROM—	POUNDS.	VALUE.
Europe:		
Total, 1913-14	42,023	\$42,023
Total, 1912-13	77,300	77,300
Total, 1911-12	41,098	41,098
Total, 1910-11	61,283	61,283
Total, 1909-10	80,567	80,567
Total, 1908-09	71,810	71,810
Total, 1907-08	93,545	93,545

RE-EXPORTS OF GUTTA PERCHA.

TO—	POUNDS.	VALUE.
Germany	330	\$195
Netherlands	6,946	1,090
Canada	7,373	3,970
Total, 1913-14	14,649	\$5,255
Total, 1912-13	22,352	2,665
Total, 1911-12	1,011	945
Total, 1910-11	62,391	19,235
Total, 1909-10	74,137	13,886
Total, 1908-09	9,370	3,730
Total, 1907-08	5,000	700

GUTTA JELUTONG.

IMPORTS OF GUTTA JELUTONG (PONTIANAK).

FROM—	POUNDS.	VALUE.
Europe:		
Netherlands	43,942	\$2,351
United Kingdom—England	124,228	5,479
Total	168,170	\$7,830

Asia:			
East Indies			
British			
Straits Settlements	1,626,088	\$1,143,075	
Dutch	13,316	4,497	
Total	24,758,401	\$1,147,572	
Total, 1913-14	21,966,571	\$1,155,402	
Total, 1912-13	45,345,338	2,174,441	
Total, 1911-12	48,795,68	2,353,080	
Total, 1910-11	51,420,872	2,872,633	
Total, 1909-10	52,392,444	2,419,213	
Total, 1908-09	24,826,296	852,372	
Total, 1907-08	22,803,303	1,039,776	
Total, 1906-07	28,437,660	1,085,098	
Total, 1905-06	21,390,116	733,074	
Total, 1904-05	19,104,911	641,319	
Total, 1903-04	14,887,416	430,331	
Total, 1902-03	13,984,817	345,431	
Total, 1901-02	16,850,821	501,418	
Total, 1900-01	9,371,087	248,838	
Total, 1899-00	8,701,753	237,214	
Total, 1898-99	6,473,882	166,419	

RE-EXPORTS OF GUTTA JELUTONG (PONTIANAK).

To	POUNDS	VALUE.
Germany	32,000	\$2,000
Total, 1913-14	32,000	\$2,000
Total, 1912-13	3,000	163
Total, 1911-12	118,486	6,079
Total, 1910-11	2,139	112
Total, 1909-10		

BALATA.

IMPORTS OF BALATA.

From—	POUNDS.	VALUE.
Europe:		
United Kingdom—England	13,751	\$7,176
Total	13,751	\$7,176
North America		
Canada	6,985	\$3,289
Cent. Amer. Sts. Panama	36,602	110,281
British West Indies		
Bahamas	3,987	2,000
Trinidad and Tobago	58,185	24,535
Total	305,759	\$140,125
South America		
British Guiana	104,765	\$58,284
Dutch Guiana	609,992	375,747
Venezuela	498,757	211,794
Total	1,213,514	\$645,825
Total, 1913-14	1,533,024	\$793,126
Total, 1912-13	1,318,598	766,772
Total, 1911-12	1,517,066	984,012
Total, 1910-11	878,305	624,702
Total, 1909-10	399,003	196,878
Total, 1908-09	1,157,018	522,872
Total, 1907-08	584,552	276,756
Total, 1906-07	799,029	305,041
Total, 1905-06	374,210	152,689

RE-EXPORTS OF BALATA.

To	POUNDS	VALUE.
Belgium	6,929	\$4,002
Germany	64,796	28,089
United Kingdom		
England	104,115	66,936
Scotland	48,633	28,112
Total, 1913-14	223,983	\$127,139
Total, 1912-13	118,334	77,963
Total, 1911-12	62,529	38,423
Total, 1910-11	264,589	230,575
Total, 1909-10		42,750
Total, 1908-09		223,907
Total, 1907-08		18,741
Total, 1906-07		12,659

GUAYULE.

IMPORTS OF GUAYULE GUM.

From	POUNDS.	VALUE.
Europe		
Germany	35,789	\$10,557
Total	35,789	\$10,557
North America		
Mexico	1,440,015	\$596,519
Total	1,440,015	\$596,519
Total, 1913-14	1,475,804	\$607,076
Total, 1912-13	10,218,191	4,345,088
Total, 1911-12	14,238,625	6,463,787
Total, 1910-11	19,749,522	10,443,157

RE-EXPORTS OF GUAYULE GUM.

To	POUNDS	VALUE.
Germany	54,149	\$21,320
United Kingdom—England		
England, 1913-14	56,896	\$22,675
England, 1912-13	82,760	32,669
Total, 1911-12	197,948	98,517
Total, 1910-11	349,461	139,808
(Not reported until 1910-11)		

IMPORTS OF ELASTICON AND SIMILAR SUBSTITUTES FOR INDIA RUBBER.

From	POUNDS	VALUE.
Europe		
France	84,364	\$43,604
Germany	2,682	
United Kingdom		
England	38,123	
Scotland	1,131	
Total	87,647	\$87,647
North America		
Canada	82	\$2
Total	82	\$2
Total, 1913-14	87,647	\$87,647
Total, 1912-13	97,432	
Total, 1911-12	87,328	
Total, 1910-11	115,601	
Total, 1909-10	114,516	
Total, 1908-09	60,628	
Total, 1907-08	7,600	

SCRAP RUBBER.

QUANTITY AND VALUE OF IMPORTS, BY COUNTRIES.

From—	POUNDS.	VALUE.
Europe		
Austria-Hungary	32,716	\$2,128
Belgium	73,386	64,757
Denmark	478,386	36,769
France	134,400	11,480
Germany	3,237,821	282,960
Italy	1,942,003	138,758
Netherlands	8,963	625
Norway	35,402	2,751
Sweden	708,420	42,347
Switzerland	363,785	28,983
United Kingdom	32,658	4,420
Russia in Europe	5,018,555	483,522
Spain	3,693	3,664
Sweden	889,510	48,935
Switzerland	3,478	213
United Kingdom	378,107	29,087
England	6,074,033	474,816
Scotland	1,688	596
Total	19,845,734	\$1,666,075
North America		
Bermuda	2,063	\$101
Canada	5,188,446	7,766
Central American Sts.	1,597	363
Caribbean	55,74	24
Mexico	2,418,57	79,337
North Atlantic and Labrador	84,184	4,114
West Indies, British	9,915	703
Trinidad and Tobago	1,120	65
Oil of British	4,681	109
Cuba	184,480	11,466
Santo Domingo	87	57
Total	5,745,77	\$411,473
South America		
Colombia	1,120	135
Guatemala	6,885	403
Venezuela	1,244	80
Total	9,049	\$618
Asia		
China	3,799	\$2,034
Hongkong	1,400	1,109
Japan	1,650	1,12
Russia in Asia	214,380	16,147
Turkey in Asia	2,143	1,549
Total	2,966	\$2,096
Oceania		
British		
Australia and Tasmania	17,966	\$550
New Zealand	1,774	89
Philippine Islands	33,727	2,602
Total	53,467	\$3,241

To	POUNDS	VALUE.
Europe		
Belgium	25,958,261	\$2,063,198
France	43,385,456	3,709,238
Germany	2,769,196	2,769,196
Italy	26,448,296	2,384,570
Netherlands	37,364,671	2,998,697
Norway	20,497,695	1,543,267
Sweden	16,331,035	1,496,822
Switzerland	9,333,197	2,089,957
Total, 1905-06	24,756,486	1,721,678
Total, 1904-05	15,375,214	953,439
Total, 1903-04	20,700,570	1,164,755
Total, 1902-03	24,659,394	1,516,137
Total, 1901-02	23,894,900	1,437,650
Total, 1900-01	15,235,236	988,316
Total, 1899-00	19,093,547	1,249,231
Total, 1898-99	10,513,604	642,044
Total, 1897-98	9,488,327	339,374
Total, 1896-97	3,653,945	113,722
Total, 1895-96	3,874,677	123,068
Total, 1894-95	2,032,563	63,112
Total, 1893-94	1,774,008	55,603
Total, 1892-93	910,543	25,633
Total, 1891-92	1,841,786	66,775

*Included in "Russia in Europe" prior to 1911.

QUANTITY AND VALUE OF EXPORTS, BY COUNTRIES.

To	POUNDS	VALUE.
Austria-Hungary	77,073	\$15,374
Belgium	82,433	12,923
Denmark	4,464	1,100
France	888,886	95,567
Germany	514,720	98,485
Italy	78,267	5,696
Netherlands	249,163	35,108
Norway	10,815	2,220
Russia in Europe	20,658	5,157
Sweden	60,856	9,403
United Kingdom		
England	3,126,182	206,623
Scotland	22,165	3,219
Canada	1,032,429	105,883
Japan	40,491	1,534
Total, 1913-14	6,207,672	\$598,287
Total, 1912-13	7,269,465	800,442
Total, 1911-12	7,336,984	780,188
Total, 1910-11	7,049,729	723,664
Total, 1909-10	6,143,610	578,944
Total, 1908-09	4,071,795	402,897
Total, 1907-08	4,255,789	449,727
Total, 1906-07	4,756,621	548,695
Total, 1905-06		239,507
Total, 1904-05		61,945

c) Not officially reported

RE-EXPORTS OF SCRAP RUBBER.

To	POUNDS	VALUE.
Canada	24,265	\$3,450
England, 1913-14	24,293	\$3,450
England, 1912-13	87,630	10,723
Total, 1911-12	30,108	28,196
Total, 1910-11	401,231	43,338
Total, 1909-10	61,495	7,373
Total, 1908-09	38,706	6,693
Total, 1907-08	21,713	2,943
Total, 1906-07	105,463	1,444

RECLAIMED RUBBER.

QUANTITY AND VALUE OF EXPORTS, BY COUNTRIES.

To	POUNDS	VALUE.
Belgium	69,344	\$3,443
France	378,503	4,717
Germany	28,186	1,322
Italy	14,085	1,599
Russia in Europe	44,867	6,052
Sweden	47,605	5,110
United Kingdom		
England	7,308,1	8,33
Scotland	1,889	1,701
Canada	2,880,556	37,121
Japan	7,247	12,440
Australia and Tasmania	150	13
Total, 1913-14	5,583,860	\$884,440
Total, 1912-13	5,413,247	637,604
Total, 1911-12	5,397,806	675,501
Total, 1910-11	4,994,57	781,650
Total, 1909-10	3,602,556	535,765
Total, 1908-09	3,196,551	474,861
Total, 1907-08	2,947,974	458,738
Total, 1906-07	4,550,788	665,109
Total, 1905-06	4,084,696	577,841
Total, 1904-05		5,112

c) Not officially reported

*Included in India Rubber prior to 1911.

EXPORTS OF AMERICAN RUBBER GOODS, FISCAL YEAR ENDED JUNE 30, 1914.

EXPORTED TO	Belting, Packing and Hose.	Boots.		Shoes.		Tires—		Other Goods. Value.	Total Value.
		Pairs.	Value.	Pairs.	Value.	For Auto- mobiles. Value.	All Other. Value.		
EUROPE									
Austria-Hungary	\$3,247	.....	\$205	6,373	\$3,881	\$1,009	\$254	\$6,566	\$15,162
Azores and Madeira Islands	35	.....	.....	302	219	138	8	390	790
Belgium	3,782	177	672	31,780	15,278	15,730	634	34,462	70,558
Bulgaria	776	.....	.....	174	92	170	.....	.....	1,038
Denmark	9,494	444	1,090	36,033	19,110	11,414	4,253	5,626	50,987
Finland	1,979	.....	.....	.....	.....	4,585	1,944	1,122	9,630
France	62,319	296	1,088	43,181	23,379	5,448	15,284	74,259	180,977
Germany	65,283	769	2,646	141,892	74,341	132,181	202	382,930	657,583
Gibraltar	.....	.....	.....	182	120	.....	.....	.....	120
Greece	.....	.....	.....	.....	.....	71	132	297	700
Italy	4,427	575	1,602	13,445	7,459	915	8,820	19,496	42,719
Netherlands	4,640	.....	4	4,176	1,764	2,286	7,016	30,412	46,122
Norway	7,756	.....	.....	40,084	21,521	5,649	4,668	4,116	43,710
Portugal	574	30	114	198	145	157	90	482	1,512
Roumania	686	.....	.....	6,844	4,330	211	.....	.....	5,227
Russia in Europe	7,095	.....	.....	340	210	1,168	522	2,692	11,687
Spain	2,230	204	810	7,471	3,991	1,595	2,212	2,390	13,228
Sweden	2,307	444	815	2,274	1,648	77,537	45,077	3,613	130,992
Switzerland	453	72	311	24,260	12,969	.....	.....	970	14,703
Turkey in Europe	.....	.....	.....	56,498	29,325	.....	.....	52	29,377
United Kingdom	.....	.....	.....	.....	.....	.....	.....	.....	.....
England	334,295	18,824	44,615	539,626	238,011	1,503,440	96,071	1,015,960	3,232,392
Scotland	11,774	.....	.....	54,582	26,746	336	.....	3,721	42,577
Ireland	176	.....	.....	2,329	640	.....	.....	.....	816
Total, Europe	\$593,273	21,897	\$53,972	1,011,894	\$484,379	\$1,764,440	\$187,187	\$1,589,556	\$4,602,607
NORTH AMERICA:									
Bermuda	\$436	.....	.....	331	\$208	\$267	\$1,065	\$4,430	\$6,406
British Honduras	1,564	19	\$52	234	147	727	42	839	3,371
Canada	306,707	28,949	92,781	70,660	46,711	961,937	22,419	926,813	2,357,378
Central American States	.....	.....	.....	.....	.....	.....	.....	.....	.....
Costa Rica	9,489	.....	.....	110	59	6,877	1,998	5,638	24,061
Guatemala	8,376	.....	.....	60	36	5,547	827	3,660	18,446
Honduras	8,332	.....	.....	105	57	1,392	145	2,390	12,316
Nicaragua	4,989	13	55	33	42	180	61	9,331	14,658
Panama	140,805	4,152	7,120	9,268	5,866	18,362	11,156	38,132	221,441
Salvador	10,472	.....	.....	66	32	2,084	116	18,443	31,147
Mexico	269,483	77	308	1,998	965	111,948	23,534	91,732	497,970
Miquelon, Langley, etc.	154	439	1,340	909	480	.....	.....	49	2,023
Newfoundland and Labrador	5,577	8,441	20,849	46,265	24,542	1,668	937	10,973	64,546
West Indies—									
British—	.....	.....	.....	.....	.....	.....	.....	.....	.....
Barbados	278	9	33	.....	.....	4,351	711	1,151	6,524
Jamaica	7,280	10	36	1,558	1,039	55,361	586	7,580	71,882
Trinidad and Tobago	7,258	.....	.....	3	3	17,023	1,745	6,326	32,355
Other British	2,383	.....	.....	415	362	2,472	667	3,805	9,689
Cuba	127,817	595	1,524	2,527	1,229	55,236	95,567	133,360	414,733
Danish	634	.....	.....	386	286	1,739	299	407	3,365
Dutch	311	.....	.....	46	30	746	35	950	2,072
French	.....	2	10	.....	.....	1,045	961	318	2,334
Haiti	1,266	.....	.....	366	208	2,336	259	1,456	5,525
Santo Domingo	10,330	6	13	612	597	2,902	4,988	8,301	27,131
Total, North America	\$923,941	42,712	\$124,121	135,952	\$82,899	\$1,254,200	\$168,128	\$1,276,084	\$3,829,373
SOUTH AMERICA:									
Argentina	\$37,824	140	\$389	6,659	\$2,939	\$21,920	\$7,553	\$49,895	\$120,520
Bolivia	454	100	308	.....	.....	1,526	54	976	3,318
Brazil	25,084	1,298	2,771	32,803	19,925	11,839	5,931	53,722	119,272
Chile	71,113	930	4,643	9,957	5,676	10,639	19,805	27,383	139,259
Colombia	12,172	11	48	2,501	1,440	18,925	4,724	8,025	45,334
Ecuador	37,096	3	11	985	590	3,313	2,726	4,553	48,289
Guiana	.....	.....	.....	.....	.....	.....	.....	.....	.....
British	980	2	10	5,508	2,267	3,420	921	1,342	8,940
Dutch	315	.....	.....	.....	.....	544	.....	343	1,202
French	.....	.....	.....	.....	.....	.....	.....	7	7
Paraguay	98	.....	.....	.....	.....	.....	.....	142	240
Peru	26,919	412	2,092	138	67	4,835	2,589	7,650	44,152
Uruguay	5,476	12	34	6,293	3,789	17,987	16,222	19,053	62,561
Venezuela	8,591	.....	.....	937	558	20,439	1,418	11,371	42,377
Total, South America	\$226,122	2,908	\$10,306	65,781	\$37,251	\$115,387	\$61,943	\$184,462	\$635,471
ASIA:									
Arden	.....	48	\$135	2,069	1,462	55	166	.....	221
China	\$21,312	.....	.....	2,069	1,462	28,326	16,108	6,995	74,338
Ceylon	5,108	.....	.....	228	156	2,578	.....	244	8,086
East Indies:									
British	.....	.....	.....	.....	.....	.....	.....	.....	.....
British India	9,869	86	158	696	581	3,555	23	4,467	18,653
Strait Settlements	5,893	.....	.....	.....	.....	7,174	124	340	10,531
Other British	143	1	4	.....	.....	30	291	454	922
Dutch	399	.....	.....	.....	.....	2,677	3,599	1,760	8,435
Hongkong	4,217	78	209	454	357	1,057	1,722	4,183	11,745
Japan	19,655	6,872	13,500	24,132	12,086	18,629	16,208	60,283	227,257
Russia in Asia	353	19	69	.....	.....	.....	.....	4	426
Siam	25	.....	.....	.....	.....	92	.....	26	143
Turkey in Asia	756	.....	.....	7,780	3,772	.....	.....	.....	4,528
Total, Asia	\$151,676	7,104	\$14,075	35,359	\$18,414	\$64,173	\$38,241	\$78,756	\$365,285
OCEANIA:									
British	.....	.....	.....	.....	.....	.....	.....	.....	.....
Australia and Tasmania	\$18,997	10,219	\$26,543	346,410	\$183,634	\$94,321	\$2,400	\$107,026	\$596,851
New Zealand	35,434	10,492	33,643	14,177	9,331	35,695	4,397	49,066	167,556
Other British	.....	24	77	4,172	3,434	432	.....	249	4,192
French	1,078	132	721	7,879	7,370	7,278	1,271	715	19,333
German	43	.....	.....	.....	.....	396	115	3	557
Portuguese Islands	50,944	2,742	7,219	8,899	5,375	141,205	93,801	123,814	422,358
Total, Oceania	\$71,317	23,609	\$68,203	381,537	\$209,144	\$279,327	\$101,984	\$280,873	\$1,210,847

EXPORTS OF AMERICAN RUBBER GOODS, FISCAL YEAR ENDED JUNE 30, 1914.—Continued.

EXPORTED TO—	Belting, Packings and Hoses.	Pairs.	Boots. Value.	Shoes. Value.	For Auto- mobiles.	Tires. All Other.	Other Goods.	Total Value.
AFRICA								
British Africa—								
West	\$1,013			36	\$29	\$115	\$370	\$1,527
South	2,133,476	3,131	\$8,529	3,335	2,041	5,153	42,429	308,718
East						64	35	57
Cannary Islands	47						419	466
Egypt	8,773			100	81	377	87	
French Africa	2,580			40		107	60	2,776
German Africa						102		102
Liberia				41	24			24
Morocco	30							20
Portuguese Africa	40,698						376	41,074
Total, Africa	\$270,609	3,131	\$8,529	3,645	\$2,190	\$5,889	\$43,741	\$364,910
Grand Total, 1913-14	\$2,377,887	101,361	\$70,206	1,634,258	\$834,289	\$3,503,900	\$563,372	\$3,453,472
Grand Total, 1912-13	2,605,551	109,838	\$71,330	2,231,467	1,163,953	3,943,220	611,458	3,913,036

Boots and Shoes¹

		Pairs.	Value.						
Grand Total, 1911-12	2,315,484	.....	2,545,076	1,502,890	.....	2,657,809	546,833	4,144,273	11,167,189
Grand Total, 1910-11	2,163,416	.....	3,984,332	2,219,430	.....	2,085,107	592,470	3,886,825	10,947,248
Grand Total, 1909-10	1,660,818	.....	3,761,084	1,984,739	.....	.....	.....	5,115,331	9,060,895
Grand Total, 1908-09	1,498,445	.....	2,396,435	1,292,673	.....	.....	.....	3,823,956	6,615,074
Grand Total, 1907-08	1,347,775	.....	3,080,253	1,614,290	.....	.....	.....	3,743,040	6,705,105
Grand Total, 1906-07	1,253,369	.....	2,310,420	1,231,898	.....	.....	.....	3,729,643	6,214,910
Grand Total, 1905-06	1,221,159	.....	2,693,690	1,505,082	.....	.....	.....	2,966,144	5,692,385
Grand Total, 1904-05	994,100	.....	2,390,539	1,214,343	.....	.....	.....	2,572,375	4,780,817
Grand Total, 1903-04	880,010	.....	2,310,420	1,231,898	.....	.....	.....	3,729,643	6,214,910
Grand Total, 1902-03	819,985	.....	2,307,401	1,056,491	.....	.....	.....	2,299,875	4,176,351
Grand Total, 1901-02	634,146	.....	2,594,708	1,046,315	.....	.....	.....	1,781,941	3,462,402
Grand Total, 1900-01	565,726	.....	1,459,100	724,015	.....	.....	.....	1,727,527	3,017,268

¹ Included in "Russia in Europe" prior to 1911. ² Stated separately after 1912. Tires were not specifically reported before 1910-11.

SUMMARY.

	1911-12.		1912-13.		1913-14.		
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	
IMPORTS OF FOREIGN MERCHANDISE—							
India rubber, etc., and substitutes for, and manufactures of:							
Unmanufactured—							
Balata	<i>pounds. free</i>	1,517,066	\$984,012	1,318,598	\$766,772	1,533,024	\$793,126
Guayule gum		14,238,625	6,463,787	10,218,191	4,345,088	1,475,804	607,076
Gutta jelutong		48,795,268	2,255,050	45,345,338	2,174,441	24,926,571	1,155,402
Gutta percha		1,204,406	225,797	480,853	167,313	1,846,109	323,567
India rubber		110,210,173	93,013,255	113,384,359	90,170,316	131,995,742	71,219,851
India rubber scrap or refuse, fit only for remanufacture.		26,293,192	2,095,605	43,385,456	3,709,238	25,958,261	2,063,198
Total unmanufactured imports.....		202,258,730	\$105,037,506	214,132,795	\$101,333,168	187,735,511	\$76,162,220
Manufactures of—							
Gutta percha	<i>dutiable</i>		\$41,098		\$77,300		\$42,023
India rubber			874,736		1,217,236		1,517,789
Substitutes, elasticon and similar.....			87,328		97,452		87,642
Total manufactured imports.....			\$1,003,162		\$1,391,988		\$1,647,454

RE-EXPORTS OF FOREIGN MERCHANDISE—

India rubber, etc., and substitutes for, and manufactures of:

Unmanufactured—

Balata	free	62,529	\$38,423	118,334	\$77,963	223,983	\$127,139
Guayule gum	197,948	98,517	83,769	54,669	56,399	22,378	
Gutta jelutong	118,486	6,079	3,000	163	32,330	2,195	
Gutta percha	1,011	945	22,352	2,665	14,319	5,060	
India rubber	5,610,951	4,890,905	5,272,387	4,476,379	3,747,749	2,398,150	
India rubber scrap or refuse, fit only for remanufacture	302,105	28,196	87,930	10,723	24,316	2,450	
Total unmanufactured re-exports	6,293,030	\$5,063,065	5,587,772	\$4,622,562	4,099,096	\$3,557,372	
Manufactures of—							
Gutta percha	dutiable	.....	\$65	.....	\$27,906	.....	.....
India rubber	6,681	.....	7,973	.....	.....	.....	\$7,638
Substitutes, elasticon and similar	231	.....	559	.....	.....	.....	.....
Total manufactures re-exported .....	.....	\$6,977	.....	\$36,438	.....	.....	\$7,638

EXPORTS OF DOMESTIC MANUFACTURES—

India rubber, manufactures of:

Scrap and old	pounds	7,336,984	\$780,188	7,269,465	\$880,442	6,207,678	\$598,287
Reclaimed	5,397,806	875,501	5,413,247	932,904	5,583,860	834,440	
Belting, hose and packing .....	.....	2,315,424	.....	2,605,551	.....	2,372,887	
Boots and shoes—							
Boots	pairs	2,545,076	1,502,890	1,09,528	714,336	101,361	279,206
Shoes .....	{	.....	.....	2,231,467	1,163,953	1,634,258	834,289
Tires—							
For automobiles .....	.....	.....	2,657,809	.....	3,943,220	.....	3,505,267
All other .....	.....	.....	546,833	.....	611,458	.....	563,372
All other manufactures of .....	.....	.....	4,144,273	.....	3,913,036	.....	3,453,472
Total domestic manufactures exported .....	.....	\$12,822,918	.....	\$14,324,894	.....	.....	\$12,441,220

THE MARKET FOR CHEMICALS AND COMPOUNDING INGREDIENTS.

THE chemical market has been more or less affected by the difficulties in shipping from foreign countries during war times. The list shows advanced prices, with supplies sufficient for the present. Zines are in fair demand and foreign grades are arriving in limited quantities; the prices, however, have not changed. The same can be said of the lead compounds. Dry colors are firmer this month, with some grades affected by the embargo shipments from Germany. There is very little change, however, in the local market. There is good demand for certain grades of domestic barytes. Foreign grades arrive occasionally and there is no scarcity of stock. Lithopone is normal and manufacturers are disposing of their output without difficulty. Foreign grades are being quoted and arrivals reported. The scarcity of chalk is having a marked effect on the whitening market, which cannot improve until sufficient quantity of the raw material is available to meet normal requirements. Prices for the various vegetable and mineral oils used in the trade are nominal and the demand has been quiet throughout the month. Aniline and corn oil, however, have advanced.

In general it can be said that irregular prices have characterized the local market during the past month. Actual business has not been unusually active, although certain compounding ingredients have met with a good demand.

PRICES OF CHEMICALS AND COMPOUNDING INGREDIENTS.

FEBRUARY 27, 1915.

Acetic acid, 28 per cent.....lb.	\$ 0.0134 @ \$ 0.02
Acetic acid, glacial.....lb.	0734 @ .0814
Acetone.....lb.	.18 @ .20
Alba whitening.....ton	8.00 @ 13.00
Aluminum flake.....lb.	.0134 @ .015
Aniline oil.....lb.	.75 @ .80
Antimony, crimson, sulphuret of.....lb.	.40 @ .50
Antimony, golden, sulphuret of.....lb.	.35 @ .45
Arsenic sulphide.....lb.	.12 @ .15
Asbestos.....ton	16.00 @ 18.00
Barytes, domestic.....ton	17.00 @ 18.00
Barytes, foreign.....ton	19.00 @ 20.00
Bayberry wax.....lb.	.25 @ .27
Beeswax, white.....lb.	.45 @ .55
Benzol, 90 per cent.....lb.	.30 @ .35
Black hypo.....lb.	.25 @ .27
Blanc fixe.....lb.	.0375 @ .04
Cadmium, yellow.....lb.	1.25 @ 1.50
Carbon bisulphide.....lb.	.0612 @ .0712
Carbon gas.....lb.	.04 @ .06
Carbon tetra-chloride, drums.....lb.	.12 @ .13
Ceresin wax, white.....lb.	.10 @ .25
Chalk, light precipitated.....lb.	.041 @ .0512
China clay, domestic.....ton	8.00 @ 9.00
China clay, imported.....ton	14.00 @ 16.00
Chrome, yellow.....lb.	.1034 @ .12
Chrysomel, green.....lb.	.22 @ .30
Coal tar naphtha.....lb.	.28 @ .30
Corn oil, crude.....100 lbs.	6.25 @ 6.30
Fossil flour.....lb.	.35 @ .40
Fossil flour, 1st grade.....lb.	.60 @ .65
Glycerine, C. P., bulk.....lb.	.2112 @ .2134
Graphite.....lb.	.08 @ .12
Green oxide of chromium.....lb.	.30 @ .35
Iron oxide.....lb.	.0212 @ .0812
Infusorial earth.....lb.	.30 @ .35
Ivory black.....lb.	.08 @ .12
Lampblack.....lb.	.0334 @ .07
Lead, sublimed white.....lb.	.0712 @ .08
Lead, white (basic carbonate).....lb.	.05 @ .0514
Lead, white (basic sulphate).....lb.	.0434 @ .05
Linseed oil, carload.....gal.	.55 @ .60
Litharge.....lb.	.05 @ .06
Litharge, English.....lb.	.0924 @ .0934
Lithopone, American.....lb.	.0334 @ .0412
Lithopone, imported.....lb.	.0412 @ .0512
Magnesia, carbonate.....lb.	.0434 @ .0512
Magnesia, calcined, powder.....ton	40.00 @ 45.00

Naphtha, V. M. & P., deodorized.....gal.	.09 @ .11
Naphtha, 73/76 deg.....gal.	.24 @ .26
Naphtha, 86 deg.....gal.	.26 @ .28
Orange mineral, domestic.....lb.	.0714 @ .0814
Ozokerite, refined white.....lb.	.30 @ .40
Paraffine wax, domestic 120 m. p.....lb.	.0412 @ .0434
Pine tar, retort.....bbl.	6.50 @ 7.00
Prussian blue.....lb.	.46 @ .48
Pumice stone, powder.....lb.	.0112 @ .02
Rape seed oil, blown.....gal.	.78 @ .80
Red lead, domestic.....lb.	.0512 @ .06
Red lead, English.....lb.	.0812 @ .09
Red oxide, domestic.....lb.	.0512 @ .07
Rosin oil.....gal.	.25 @ .55
Shellac, fine orange.....lb.	.17 @ .19
Soapstone, powdered.....ton	10.00 @ 12.00
Sulphur chloride, in drums.....lb.	.0612 @ .08
Sulphur, flowers.....cwt.	2.20 @ 2.60
Sulphuric acid, c. p.....lb.	.0512 @ .0712
Talc, American.....ton	15.00 @ 20.00
Talc, French.....ton	15.00 @ 25.00
Turpentine, spirits.....gal.	.4412 @ .45
Ultramarine blue.....lb.	.0312 @ .13
Vermilion, Chinese.....lb.	.90 @ 1.00
Whiting, commercial.....cwt.	.45 @ .50
Whiting, Paris white, American.....cwt.	.70 @ .75
Whiting, English cliffstone.....cwt.	.75 @ 1.10
Zinc oxide, American process.....lb.	.0534 @ .06
Zinc oxide, French process, red seal.....lb.	.07 @ .08
Zinc oxide, French process, green seal.....lb.	.0712 @ .08
Zinc oxide, French process, white seal.....lb.	.08 @ .09

THE SCRAP RUBBER MARKET.

THEERE was very little business in the scrap rubber market during the first week of the month. Prices on shoes and tires were unchanged from the week before. The settlement of the rubber embargo question is no doubt the cause of the present dullness and prevailing prices. During the second week auto tires developed weakness, selling to the mills at 4½ cents a pound. Shoes remained nominal, with 7¾ cents as the best price that could be obtained from the consumer. The market in a general way reflected the lack of activity on the part of the reclaimers. The result is an easier market and a poor demand for shoes. In some quarters they are bought for 75¢ cents, but most of the large dealers are holding out for 7¾ cents. Auto tires are still quoted at 4½ cents, and inner tubes are easier, at 22½ to 23 cents to the mills. There is no marked change reported in other grades. The trade has been expecting to hear that Canada's embargo against shipments of scrap rubber has been lifted, but nothing definite has so far developed.

RUBBER SCRAP PRICES PAID BY CONSUMERS FOR CARLOAD LOTS.

New York, February 27, 1915.

	Per Pound
Boots and shoes.....cents	71/2 @ 73/4
Trimmed arctics.....	6 @ 6 1/4
Auto tires.....	41/2 @ 43/4
Solid tires.....	41/2 @ 43/4
No. 1 inner tubes.....	24 @ 26
No. 2 inner tubes.....	11 1/2 @ 12 1/2
Red tubes.....	13 @ 13 1/2
Bicycle tires.....	3 @ 3 1/4
Irony tires.....	11 1/4 @ 2 1/4
No. 1 auto peelings.....	8 1/4 @ 9 1/4
Mixed auto peelings.....	7 @ 7 1/2
No. 1 soft white rubber.....	11 @ 12
White wringer rubber.....	9 @ 9 1/2
No. 1 red scrap.....	10 @ 11
Mixed red scrap.....	7 1/4 @ 7 3/4
Mixed black scrap.....	21 1/4 @ 21 3/4
Rubber car springs.....	31 1/2 @ 32
Horse shoe pads.....	3 @ 3 1/4
Mattings and packing.....	5 @ 5 1/4
Garden hose.....	3 @ 3 1/4
Air brake hose.....	3 1/4 @ 3 3/4
Cotton fire hose.....	2 @ 2 1/4

Review of the Crude Rubber Market.

NEW YORK.

THE month opened with good inquiries for all grades, particularly Plantation, but spot stocks were small and actual business consequently restricted. First latex crepe sold at 62@64 cents and Upriver fine was steady at 60@61 cents. During the week the demand from manufacturers was light. Plantation rubber was arriving regularly and it was reported that ample supplies from London could be counted on. Brazil arrivals were also regular. These prospects broke prices at the end of the week to 59@60 cents for first latex crepe, and 58@59 cents for Upriver fine.

The market developed a firm tone in Plantation with slight price fluctuations during the second week. Para sorts were irregular and pressure to sell was noticed. First latex was firm at 61 cents and Upriver fine unsettled at 58 cents. Very little change was noted during the third week. The market continued firm and prices steady. Rubber was arriving, but subject to considerable delay on account of the new guarantee system. Spot prices were steady. First latex crepe at 58@59, and Upriver fine at 58@60 cents.

The month is closing with Plantation firm. First latex crepe for spot advanced to 63 cents. Smoked ribbed sheets were marked up to 65@66, and Upriver fine closed firm at 58 cents. The demand is nominal for spot, and future delivery shipments from London are irregular and uncertain. The new arrangements for handling the guarantees are working in a satisfactory manner. Some Plantation rubber arrived on the "Sebek" from London late in February and the "Cheltonian" and "St. Stephen," both from the same port, are on the high seas. It is not known how much rubber will arrive by these ships as no information is given out concerning cargo from London. The "Justin" from Maranh, Ceara, Parnahyba and Para arrived with 540 tons February 23. The "Rio de Janeiro" from Para was due February 27 with 405 tons. The "Denis" from Manaos and Para is due March 1 with 1,280 tons. The "Atahualpa," sailing from Manaos and Para, is due to arrive March 10.

THE LONDON MARKET.

As the obstacles placed by the government in the way of exporting rubber to America had been removed, by the first of the month shipments began to go forward as rapidly as docking facilities would permit. The amount of rubber held in London for American account, February 1, was 3,500 tons. During the first week there was little change in the market, which had been fairly active and steady. The prospect of American trade resulted in firm prices for spot Plantation. Standard crepe sold at 2s. 2½d.; smoked sheet at 2s. 4d., and hard fine at 2s. 6d. The market continued firm and steady, with Plantation prices marked up from 1 to 1½d. per pound. Shippers were unable to secure cargo space, and instances of short shipments were frequent. During the last week Standard crepe sold at 2s. 3¼d. to 2s. 4d., with Smoked sheet at 2s. 4½d. for prompt shipment. It is reported that the sailings of several steamers plying between London and America will be discontinued.

NEW YORK QUOTATIONS.

Following are the quotations at New York one year ago, one month ago, and February 27, the current date:

PARA.	March 1, '14.	Feb. 1, '15.	Feb. 27, '15.
Upriver, fine, new.....	75 @ 76	60 @ 61	58½ @
Upriver, fine, old.....			60 @
Islands, fine, new.....	70 @ 71	53 @	50 @
Islands, fine, old.....			

Upriver, coarse, new.....	46 @ 47	44 @ 45	45 @ 46
Upriver, coarse, old.....			
Islands, coarse, new.....	32 @	28 @ 29	28 @
Cameta.....	36 @	32 @ 33	32 @ 33
Cancho, upper.....	47½ @ 48	45 @ 46	46 @ 48
Cancho, lower.....		40 @ 41	43 @ 44

PLANTATION TYPE.

Smoked sheet ribbed.....	62 @ 63	Spot. 65 @ 66	65 @ 66
		Prompt Sht. 60 @ 61	62½ @ 63
First latex crepe.....	61 @ 62	Spot. 60 @ 61	62 @ 63
		Prompt Sht. 56 @ 57	60 @ 61
Line sheets and biscuits unsmoked.....	61 @	Prompt Sht.	59 @ 60

CENTRALS.

Corinto.....	42 @ 43	44 @ 45
Esmeralda, sausage.....	44 @ 45	42 @ 43
Guayaquil, strip.....		
Nicaragua, scrap.....	41 @	41 @
Panama.....		43 @ 44
Mexican plantation, sheet.....		
Mexican, scrap.....	42 @ 43	
Mexican, slab.....		
Manicoba, scrap.....	38 @	
Mangabeira, sheet.....	37½ @ 40	37½ @ 40
Guayule.....	29 @ 30	
Balata, sheet.....	53 @	56 @ 57
Balata, block.....	42 @	45 @ 46

AFRICAN.

Lopori, ball, prime.....	52 @ 53	58 @
Lopori, strip, prime.....		58 @
Aruwimi.....		
Upper Congo, ball red.....		
Ikelemba.....		
Sierra Leone, 1st quality.....		
Massai, red.....	49 @ 50	51 @ 52½
Soudan Niggers.....	48 @ 50	
Cameroon, ball.....	31 @ 32	43
Benguela.....		
Madagascar, pinky.....		
Accra, flake.....	22 @ 23	23 @ 24

EAST INDIAN.

Assam.....		
Pontianak.....	6 @ 6	7 @ 8

New York.

In regard to the financial situation, Albert B. Beers (broker in crude rubber and commercial paper, No. 68 William street, New York), advises as follows: "There has been no material change during February from the general situation prevailing in January as regards commercial paper, the demand continuing good from both city and out of town banks at 4@4½ per cent. for the best rubber names and 5@5½ per cent. for those not so well known, these rates averaging about ½ per cent. lower than in January."

NEW YORK PRICES FOR JANUARY NEW RUBBER.

	1915.	1914.	1913.
Upriver, fine, new.....	83 @ 84	81 @ 82	81 @ 82
Upriver, fine, old.....		78 @ 79	78 @ 79
Islands, fine, new.....	72 @ 73	70 @ 71	70 @ 71
Islands, fine, old.....		68 @ 69	68 @ 69
Cameta.....	61 @ 62	59 @ 60	59 @ 60

London and Liverpool.

GOW, WILSON & STANTON, LTD., report [January, 1915]:

			Stocks.		
			1915.	1914.	1913.
LONDON—	Imports.	Deliveries.			
Plantation	6,146	5,407	6,643	3,866	2,722
Other kinds	88	157	731	765	731
Total	6,234	5,564	7,374	4,631	3,453
LIVERPOOL—					
Para	128	142	324	517	394
Other kinds	616	552	371	1,026	685
Total	744	694	695	1,543	1,079
Total London and Liverpool.	6,978	6,258	8,069	6,174	4,532

Singapore.

GUTHRIE & Co., Ltd., report [January 12, 1915]:

Stronger advices having been received from London, the auction sale held today opened under more favorable auspices than for some weeks past and during the forenoon prices generally marked a decided improvement. In the afternoon bidding was not nearly so brisk and prices weakened considerably.

Rubbed Smoked Sheet sold up to \$120, there being a particularly good inquiry for this grade. Fine Pale Crepe touched \$118. The lower grades of Crepe again sold very well, but Browns dragged to some extent. Scrap rubbers were quiet.

Of 125 tons catalogued 90 tons changed hands. The following was the course of values:

	In Singapore. Picul*	Sterling equivalent per pound in London.
Sheet, fine smoked.....	\$110@120	2/ 1 1/4 @ 2/3 1/2
Sheet, fair to good.....	90@108	1/ 9 1/2 @ 2/1
Sheet, unsmoked.....	84 @ 93	1/ 7 1/2 @ 1/9 1/4
Crepe, fine pale.....	113 @ 118	2/ 2 @ 2/3
Crepe, good pale.....	102 @ 109	1/ 11 1/2 @ 2/1 1/2
Crepe, fine brown to palish.....	96 @ 99	1/ 10 1/2 @ 1/11
Crepe, good brown.....	78 @ 91	1/ 6 1/2 @ 1/9 1/4
Crepe, dark.....	64 @ 87	1/ 3 1/2 @ 1/8 1/4
Crepe, barked.....	50 @ 75	1/ 0 1/4 @ 1/6
Scrap, virgin.....	51 @ 55	1/ 1 @ 1/1 1/4
Scrap, untreated.....	40 @ 55	0/10 1/2 @ 1/1 1/4

*Picul=133 1/3 pounds.

Quoted in S. S. dollars = 2/4 [56 cents].

IMPORTS FROM PARA AT NEW YORK.

[The Figures Indicate Weight in Pounds.]

JANUARY 28.—By the steamer *Stephen* from Pará and Manáos:

	Fine.	Medium.	Coarse.	Caucho.	Total.
Arnold & Zeiss.....	256,500	35,800	29,900	12,200	334,400
General Rubber Co.....	182,200	22,400	27,800	1,000	233,400
Meyer & Brown.....	161,600	48,800	15,700	6,300	232,400
H. A. Astlett & Co.....	68,600	16,900	85,600	24,700	195,800

Henderson & Korn.....	94,200	14,300	22,900	2,600	134,000
Robinson & Co.....	69,300	.....	11,300	.....	80,600
W. R. Grace & Co.....	61,300	4,400	10,800	.....	76,500
Robert Badenhop.....	44,400	3,400	6,700	.....	54,500
Crossman & Siecken.....	400	.....	2,200	.....	2,600
Thomsen & Co.....	100	300	1,500	400	2,300
Davies, Turner & Co.....	.....	.....	76,800	117,100	193,900
Total	938,600	146,300	291,200	164,300	1,540,400

FEBRUARY 2.—By the steamer *Sao Paulo* from Pará.

Arnold & Zeiss.....	32,800	3,200	92,400	.....	128,400
Meyer & Brown.....	33,500	5,400	94,400	55,000	188,300
G. Amsinck & Co.....	61,000	500	14,000	12,400	87,900
Aldens' Successors, Ltd.....	50,700	3,900	60,800	.....	115,400
Henderson & Korn.....	135,900	20,100	4,100	.....	160,100
H. A. Astlett & Co.....	27,900	12,900	12,200	5,900	58,900
Hagemeyer & Brunn.....	9,600	.....	.....	1,200	10,800
Rumsey & Greutert Co., Inc.....	24,200	2,500	1,900	.....	28,600
Total	375,600	48,500	279,800	74,500	778,400

FEBRUARY 5.—By the steamer *Gregory* from Pará and Manáos:

Henderson & Korn.....	43,900	4,700	2,300	200	51,100
Rumsey & Greutert Co., Inc.....	50,400	.....	.....	.....	50,400
Meyer & Brown.....	18,100	3,400	3,800	.....	25,300
H. A. Astlett & Co.....	3,000	1,000	9,400	.....	13,400
Arnold & Zeiss.....	10,600	10,600
Robinson & Co.....	2,000	2,000
Total	115,400	9,100	26,100	2,200	152,800

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Robinson & Co.....	11,900	1,300	6,200	8,200	27,600
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FEBRUARY 8.—By the steamer *Acre* from Pará:

	Fine.	Medium.	Coarse.	Caucho.	Total.
Meyer & Brown.....	11,100	400	8,600	20,100
Arnold & Zeiss.....	11,400	.....	15,800	11,300	38,500
Aldens' Successors, Ltd.....	.....	.....	19,100	50,400	69,500
Henderson & Korn.....	.....	.....	.....	4,700	4,700
H. A. Astlett & Co.....	28,900	7,300	25,400	58,300	119,900
G. Amsinck & Co.....	16,200	400	200	17,000	33,800
Total	67,600	8,100	69,100	141,700	286,500

FEBRUARY 17.—By the steamer *Dunstan* from Pará:

Meyer & Brown.....	28,600	400	100,200	.....	129,200
Arnold & Zeiss.....	32,800	5,600	35,100	23,100	96,600
Hagemeyer & Brunn.....	1,100	1,400	23,700	37,400	63,600
Neuss, Hesslein & Co.....	31,700	.....	8,300	5,200	45,200
Aldens' Successors, Ltd.....	6,500	.....	7,300	.....	13,800
G. Amsinck & Co.....	6,500	.....	.....	10,800	17,300
Rumsey & Greutert Co., Inc.....	11,100	.....	.....	.....	11,100
Henderson & Korn.....	12,500	.....	8,600	.....	21,100
H. A. Astlett & Co.....	16,900	5,600	67,800	.....	90,300
Davies, Turner & Co.....	.....	.....	.....	110,200	110,200
Total	141,200	13,000	251,000	186,700	591,900

OTHER NEW YORK ARRIVALS.**CENTRALS.**

[*This sign, in connection with imports of Centrals, denotes Guayule rubber.]

POUNDS.

JANUARY 18.—By the *Cicely*—New Orleans:

E. Steiger & Co..... 1,000

JANUARY 23.—By the *Sab Fido*—Galveston:

Various..... *35,000

JANUARY 25.—By the *Edna*—Baltimore:

Rosbach Bros. & Co..... 90,000

Adolph Hirsch & Co..... 7,500 97,500

JANUARY 25.—By the *Arcturion*—New Orleans:

E. Steiger & Co..... 1,000

JANUARY 25.—By the *Alma*—Columbus:

Freese & Hendon..... 700

Kendall & Sons..... 700 1,400

JANUARY 26.—By the *Nueces*—Galveston:

Various..... *80,000

JANUARY 29.—By the *Alma*—Columbus:

A. Held..... 2,500

Various..... 1,000 3,500

JANUARY 30.—By the *Alma*—Columbus:

G. Amsinck & Co..... 65,000

W. R. Grace & Co..... 28,500 93,500

JANUARY 30.—By the *Arcturion*—New Orleans:

General Export & Commission Co..... 3,500

Marquis & Feltz..... 1,000

I. A. Mohr & Co..... 700

H. Marquardt & Co..... 300

E. Steiger & Co..... 200 5,700

JANUARY 30.—By the *Alma*—Columbus:

G. Amsinck & Co..... 88,000

W. R. Grace & Co..... 18,500

I. S. Sembrada & Co..... 14,600

H. Wolf & Co..... 700

Lawrence Johnson & Co..... 33,800

Mecke & Co..... 1,900

Pablo Calvet & Co..... 4,000

A. M. Capen's Sons..... 1,200

Otto Gerlach & Co..... 7,900

Andean Trading Co..... 2,100

Pan American Sales Co..... 1,600

Various..... 600 174,900

FEBRUARY 1.—By the *El Cid*—Galveston:

Various..... *115,000

FEBRUARY 2.—By the *Alma*—Columbus:

G. Amsinck & Co..... 22,000

W. R. Grace & Co..... 11,000

M. L. Collantes..... 2,000 35,000

FEBRUARY 5.—By the *Alma*—Columbus:

G. Amsinck & Co..... 12,000

I. S. Sembrada & Co..... 300 1,500

FEBRUARY 7.—By the *Alma*—Columbus:

G. Amsinck & Co..... 17,000

American Trading Co..... 4,000

A. D. Smith & Co..... 300

Meyer Held..... 100

W. R. Grace & Co..... 300

I. S. Sembrada & Co..... 1,100

Lawrence Johnson & Co..... 1,000

G. Amsinck & Co..... 700

Pablo Calvet & Co..... 200 10,400

FEBRUARY 8.—By the *Alma*—Galveston:

Various..... *40,000

FEBRUARY 8.—By the *Alma*—New Orleans:

E. Steiger & Co..... *40,000

FEBRUARY 11.—By the *Alma*—Galveston:

Various..... *40,000

FEBRUARY 13.—By the *Yumuri*—Mexico:

E. Steiger & Co..... 1,000

FEBRUARY 15.—By the *Alma*—Columbus:

G. Amsinck & Co..... 22,100

Lawrence Johnson & Co..... 27,700

Laidlaw & Co..... 20,000

Piza, Nephews & Co..... 2,500

W. R. Grace & Co..... 39,000

Harburger & Stack..... 1,200

Mecke & Co..... 1,600

Hispano-American Sales Co., Inc..... 1,500

I. S. Sembrada & Co..... 400

Isaac Brandon Bros..... 300

Various..... 2,700 118,400

FEBRUARY 15.—By the *Alma*—Galveston:

Various..... *60,000

FEBRUARY 15.—By the *Alma*—Galveston:

Various..... *190,000

FEBRUARY 16.—By the *Alma*—Mexico:

E. Steiger & Co..... 2,000

Lawrence Johnson & Co..... 3,500

J. F. Dunbar..... 1,000 6,500

FEBRUARY 16.—By the *Alma*—Columbus:

United Fruit Co..... 1,500

G. W. Delgado..... 300 1,800

FEBRUARY 16.—By the *Alma*—New Orleans:

E. Steiger & Co..... 5,500

FEBRUARY 23.—By the *Alma*—Port Union:

G. Amsinck & Co..... 500

A. Held..... 500 1,000

FEBRUARY 23.—By the *Alma*—Columbus:

A. Rosenthal & Sons..... 1,200

FEBRUARY 23.—By the *Alma*—Columbus:

G. Amsinck & Co..... 6,500

Neuss, Hesslein & Co..... 3,000

Fidanque Bros. & Sons..... 1,500

Camacho, Roldan & Van Sichel..... 1,400

J. S. Sembrada & Co..... 500

A. M. Capen's Sons..... 4,300

Pablo Calvet & Co..... 3,000

H. Wolf & Co..... 1,200 21,400

AFRICAN.

POUNDS

JANUARY 13 By the <i>Passat</i> —Lisbon		Johnstone, Whitworth & Co., Ltd.	*300,000
Ed. Maunier	165,000	Arnold & Zeiss	*50,000
Robert Roderhop	65,000	Robinson & Co.	*70,000
W. H. Stiles	22,500	General Rubber Co.	*7,500
Various	80,000	L. Littlejohn & Co.	*70,000
	33,500	Abel's Successors, Ltd.	*60,000
JANUARY 17 By the <i>Clara</i> —Havre		Charles J. Wilson & Co., Inc.	*100,000
Various	50,000	Rubber Trading Co.	*60,000
		Various	*77,000 *3,077.00
JANUARY 17 By the <i>Stratford</i> —Lisbon		FEBRUARY 10 By the <i>Ordara</i> —Liverpool	
Meyer & Brown	30,500	The B. F. Goodrich Co.	*67,500
Arnold & Zeiss	45,000	General Rubber Co.	*33,500 *101,000
Ed. Maunier	80,000		
W. Stiles	11,200	FEBRUARY 13 By the <i>Minneapolis</i> —London	
Rosenstein & Co.	2,500	Meyer & Brown	*70,000
Various	135,000	General Rubber Co.	*190,000
	290,200	The B. F. Goodrich Co.	*115,000
FEBRUARY 1 By the <i>Albion</i> —Liverpool		Arnold & Zeiss	*4,500
Various	40,000	Charles J. Wilson & Co., Inc.	*90,000
FEBRUARY 1 By the <i>Francina</i> —Liverpool		Robert Roderhop	*50,000
Arnold & Zeiss	35,000	Good Rubber Co.	*80,000
FEBRUARY 8 By the <i>Madagascar</i> —Lisbon		Abel's Successors, Ltd.	*22,500
Various	61,500	Ed. Maunier	*45,000
FEBRUARY 11 By the <i>Nagara</i> —Havre		L. Littlejohn	*70,000
Henderson & Kornhauser	11,200	Henderson & Kornhauser	*100,000
		Adolph Hirsch & Co.	*25,000
		W. Stiles	*10,000
		Johnstone, Whitworth & Co., Ltd.	*80,000
		Rubber & Gutta Agency, Inc.	*60,000
		Various	*150,000 *1,752,500

EAST INDIAN.

POUNDS

JANUARY 13 By the <i>Luxuria</i> —Liverpool		FEBRUARY 15 By the <i>McIntosh</i> —Liverpool	
General Rubber Co.	*215,000	L. Littlejohn & Co.	*33,500
The B. F. Goodrich Co.	*210,000 *415,000	FEBRUARY 15 By the <i>St. Louis</i> —Liverpool	
JANUARY 25 By the <i>Manocharis</i> —London		General Rubber Co.	*33,500
Johnstone, Whitworth & Co., Ltd.	*20,000	FEBRUARY 15 By the <i>Leontine</i> —Liverpool	
FEBRUARY 1 By the <i>Albion</i> —Liverpool		The B. F. Goodrich Co.	*10,000
The B. F. Goodrich Co.	*415,000	General Rubber Co.	*60,000 *250,000
General Rubber Co.	*345,000 *760,000	FEBRUARY 17 By the <i>Minneapolis</i> —London	
FEBRUARY 1 By the <i>Leontine</i> —Liverpool		Meyer & Brown	*7,500
General Rubber Co.	*300,000	The B. F. Goodrich Co.	*3,500
The B. F. Goodrich Co.	*112,000	W. Stiles	*15,000
Arnold & Zeiss	*15,000 *47,000	Ed. Maunier	*57,500
FEBRUARY 4 By the <i>Albion</i> —Liverpool		L. Littlejohn & Co.	*5,000
The B. F. Goodrich Co.	*60,000	Henderson & Kornhauser	*45,000
Good Rubber Co.	*100,000	Arnold & Zeiss	*50,000
General Rubber Co.	*45,000 *265,000	Abel's Successors, Ltd.	*45,000
FEBRUARY 5 By the <i>Albion</i> —Liverpool		General Rubber Co.	*30,500
General Rubber Co.	*45,000	Charles J. Wilson & Co., Inc.	*8,000
FEBRUARY 8 By the <i>Manocharis</i> —London		Abel's Successors, Ltd.	*70,000
Meyer & Brown	*155,000	Various	*135,000 *3,767,500
Ed. Maunier	*15,000	FEBRUARY 13 By the <i>St. Louis</i> —Liverpool	
W. Stiles	*112,000	The B. F. Goodrich Co.	*10,000
Henderson & Kornhauser	*182,500	General Rubber Co.	*15,000
		Robert Roderhop	*70,000
		Charles J. Wilson & Co., Inc.	*90,000
		Abel's Successors, Ltd.	*70,000
		Various	*4,000

Rubber Trading Co.	*22,500
Robert Roderhop	*7,500
Henderson & Kornhauser	*7,500
Various	*1,177,000

FEBRUARY 23 By the <i>Cymric</i> —Liverpool	
General Rubber Co.	*7,000

CUSTOM HOUSE STATISTICS.

PORT NEW YORK, N. Y. DECEMBER 1914		
Imports	Pounds	Value
India rubber	11,440,291	\$5,069,394
Gutta percha	46,467	7,507
Gutta jelutong (Pontianak)	801,101	35,112
Various	12,487,855	\$5,188,782
Exports		
India rubber, manufactures of		111,837
Rubber scrap, imported	333,830	15,558
Rubber scrap, exported	63,528	9,606

PORT OF SAN FRANCISCO, CAL. JANUARY, 1915		
Imports	Pounds	Value
India rubber	1,600	750

PORT OF BOSTON, MASS. JANUARY, 1915		
Imports	Pounds	Value
Gutta percha	56,461	5,334
Gutta jelutong (Pontianak)	610,262	29,643

PORT OF CHICAGO, ILL.—JANUARY, 1915.		
Imports	Pounds	Value
India rubber (Canada)	17,094	804

PORT OF NIAGARA FALLS, N. Y.—JANUARY, 1915.		
Imports	Pounds	Value
India rubber	76,327	41,484

PORT OF DETROIT, MICH. JANUARY, 1915		
Exports	Pounds	Value
Rubber scrap, imported	150	11
Rubber scrap, exported	5,501	248
Rubber, reclaimed, exported	126,191	14,115

PORT OF NEW ORLEANS, LA. DECEMBER 1914		
Imports	Pounds	Value
India rubber	44,857	2,714

PORT OF NEW ORLEANS, LA. JANUARY, 1915		
Imports	Pounds	Value
India rubber	53,487	24,763

PORT OF PHILADELPHIA, PA.—JANUARY, 1915.		
Imports	Pounds	Value
Rubber scrap, imported	3,584	264
Rubber scrap, exported	1,007	45

PORT OF CHARLOTTE, N. C. JANUARY, 1915		
Imports	Pounds	Value
Rubber scrap, imported	1,007	45

EXPORTS OF INDIA RUBBER FROM PARA AND MANAOS IN 1914 AND FOR SEVENTEEN YEARS.

[The figures indicate weights in kilograms.]

EXPORTERS.	NEW YORK.					EUROPE.					GRAND TOTAL.
	Fine.	Medium.	Coarse.	Cancho.	Total.	Fine.	Medium.	Coarse.	Cancho.	Total.	
Zarges, Berninger & Co., Para	2,802,146	469,030	1,013,868	1,245,833	6,130,886	3,170,004	468,749	440,651	1,502,634	5,577,038	17,707,424
Zarges, Oeliger & Co., Manaus											
General Rubber Co. of Brazil, Para											
and Manaus	2,571,999	501,582	1,305,070	1,053,255	5,431,906	791,109	16,927	71,228	619,286	1,644,550	7,076,456
J. Marques, Para	1,266,301	245,871	1,164,971	823,275	3,460,416	35,114	23,871	88,437	18,078	1,227,504	4,688,310
Prado & Co., Manaus	1,490,378	285,626	391,381	261,215	2,428,599	1,103,463	211,596	314,322	532,085	2,161,466	4,590,066
Suarez Hermanos & Co., Limited											
Para	409,700	7,417	64,241	114,223	595,581	6,187	454	74,367	589,197	1,295,846	1,891,427
Pires Teixeira & Co., Para	239,408	34,700	657,689	90,595	1,022,399	298,082		8,001		306,537	1,328,929
Adelbert H. Allen, Limited, Para											
and Manaus	277,809	40,212	151,308	30,127	499,456	325,863	60,418	84,715	27,009	498,005	997,461
Schumann & Co., G. Deffner & Co.,											
Para and Manaus	169,567	1,170	28,462	215,599	414,798	263,095					
De Lagotellerie & Co., Para and											
Manaos	618,846	8,250	26,749	70,553	166,401	11,513	60,575	68,024	49,185	490,307	656,708
J. G. Araujo & Co., Manaus	33,247	5,008	11,431	3,403	53,179	88,951		19,459	2,278	117,677	170,856
W. Peters & Co., Manaus						1,100		3,265	530	4,895	4,895
Armazens Andriessen, Manaus			2,575		2,575			1,210		1,210	3,785
Sundries	418,753	51,731	163,493	117,775	751,752	850,560	294,151	140,144	227,447	1,322,402	2,074,154
From Itacoatiara—direct	9,700,217	1,653,209	5,578,163	4,025,853	20,957,442	8,772,246	1,094,830	1,357,115	3,774,548	14,098,739	35,956,181
From Iquitos—direct	58,844	3,592	24,595	9,000	96,031	42,994	5,014	27,443	23,146	97,597	193,628
From Iquitos—direct	213,433	20,961	43,159	355,072	632,635	255,992	15,155	77,304	589,287	637,738	1,570,363
Total, 1914	9,972,494	1,677,772	5,645,917	4,389,925	21,686,098	9,071,232	1,114,999	1,461,862	4,385,981	16,034,074	37,720,172
Total, 1913	7,223,363	1,354,794	5,324,881	3,198,077	17,101,115	11,749,008	1,591,241	2,456,162	6,338,207	22,114,618	39,215,733
Total, 1912	9,477,888	2,035,278	6,503,631	3,337,691	21,354,488	12,570,442	1,414,572	2,822,694	5,200,397	22,007,905	43,362,393
Total, 1911	7,686,680	1,571,375	5,173,230	1,669,596	16,100,881	11,390,571	1,503,869	2,564,439	4,519,039	19,757,718	35,858,599
Total, 1910	7,500,410	1,471,311	4,489,108	1,655,661	15,060,490	11,673,302	1,506,752	3,387,437	6,416,842	22,979,328	38,039,818
Total, 1909	9,439,722	1,767,310	5,784,176	2,655,778	19,646,980	9,832,613	1,372,212	2,950,626	5,649,763	19,805,223	39,452,203
Total, 1908	8,280,768	1,739,505	5,616,549	1,902,620	17,539,442	10,721,266	1,419,025	2,854,624	5,528,994	20,523,909	38,063,351
Total, 1907	8,012,592	1,863,775	5,149,312	1,580,657	16,606,336	10,783,787	1,358,264	3,190,982	5,574,783	20,907,816	37,514,152
Total, 1906	7,406,171	1,785,315	5,496,419	1,531,399	16,111,304	9,289,310	1,253,574	3,223,944	4,799,623	18,575,451	34,767,755
Total, 1905	7,173,463	1,518,444	4,921,222	1,647,216	15,260,345	10,052,634	1,261,703	2,498,516	4,765,999	18,656,543	33,916,888
Total, 1904	8,062,104	1,630,355	5,304,429	1,222,580	16,309,468	7,615,817	993,955	2,503,520	3,221,376	14,334,668	30,644,136
Total, 1903	7,248,065	1,621,827	5,029,646	1,133,857	15,033,395	9,156,872	1,167,956	2,659,748	3,076,971	16,061,547	31,094,942
Total, 1902	6,588,524	1,614,776	4,523,413	1,133,155	13,859,868	8,522,521	1,514,521	2,595,177	2,057,222	15,689,912	28,540,780
Total, 1901	8,272,727	1,926,505	4,271,456	1,325,290	15,550,978	7,939,010	1,556,358	2,605,553	2,638,599	14,739,520	30,290,498
Total, 1900	6,557,277	1,199,611	3,783,279	894,500	12,434,667	7,798,537	1,401,390	3,256,969	1,857,100	14,313,966	26,747,663
Total, 1899	7,583,405	1,319,349	4,023,710	951,854	13,878,318	6,410,647	1,030,459	2,527,013	1,583,572	11,551,691	25,430,009
Total, 1898	5,399,654	868,982	2,759,714	801,915	9,830,265	6,794,541	1,125,688	1,558,811	1,162,712	12,078,742	21,909,007



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March 1, 1915.

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Plantation Rubber from the Far East.

EXPORTS OF CEYLON GROWN RUBBER.

From January 1 to December 31, 1913 and 1914. Compiled by the Ceylon Chamber of Commerce.

To—	1913.	1914.
Great Britain	15,046,548	21,444,077
United States	6,081,164	9,175,991
France	8,903,074	9,984,009
Australia	453,993	751,920
India	364,982	1,037,415
Japan	300,659	284,506
Straits Settlements	148,440	50,989
Russia	101,116	105,212
Italy	44,284	1,772
Austria	31,434	.....
France	25,419	320,182
India	1,881	1,550
Canada	992	.....
Canada and Newfoundland	.....	77,530
Total	26,509,486	36,235,114

(Same period 1912, 14,139,091 pounds; same period 1911, 6,575,039.)

To arrive at the approximate quantity of Ceylon rubber exported for 1914 to date, deduct the quantity from the total exports. In previous years the exports of Ceylon rubber only were given.

The export figures of rubber for 1914 in the above table include the imports re-exported, viz., 3,731,016 pounds.

(From January 1 to January 11, 1914. Compiled by the Ceylon Chamber of Commerce.)

To—	1914.	1915.
Belgium	46,308	.....
Great Britain	4,636	20,850
France	.....	6,720
Total	50,944	27,570

(Same period 1913, 153,695; same period 1912, 112,871.)

The export figures of rubber given in the above table include the imports re-exported. (These amount to 31,536 pounds—6,336 pounds from the Straits and 25,200 pounds from India.) To arrive at the approximate quantity of Ceylon rubber exported to date deduct the quantity of imports shown in the import table from the total exports.

TOTAL EXPORTS FROM MALAYA.

(From January to dates named. Reported by Barlow & Co., Singapore. These figures include the production of the Federated Malay States, but not of Ceylon.)

To—	Singapore, Dec. 31.	Malacca, Dec. 31.	Penang, Nov. 30.	Port Swettenham, Dec. 31.	Total.
Great Britain	29,326,477	5,265,628	17,659,200	27,652,992	79,904,297
Continent	2,042,220	36,873	533,333	1,816,538	4,428,964
Japan	1,259,823	.....	.....	.....	1,259,823
Ceylon	97,245	.....	903,333	1,572,660	2,775,238
United States	10,732,448	15,878	911,501	244,209	11,904,036
Australia	173,964	.....	.....	.....	173,964
Total	43,834,177	5,318,279	20,009,367	31,286,399	100,448,322
Same period, 1913	27,857,983	.....	12,925,467	28,877,774	69,661,224
Same period, 1912	14,649,707	.....	7,575,764	20,254,269	42,479,740
Same period, 1911	6,635,618	.....	4,957,932	12,109,788	22,803,338

Exports from Singapore from January 1 to January 11, 1915, are as follows:

To—	Singapore, Jan. 11, 1915.
Great Britain	1,399,283
Continent	165,411
Japan	.....
Ceylon	16,100
United States	.....
Australia	.....
Total	1,580,794
Same period, 1914	683,309
Same period, 1913	1,177,456
Same period, 1912	681,046

COMPARATIVE STATISTICS OF RUBBER EXPORTS FROM JAVA AND MADURA FOR THE FIRST TEN MONTHS OF 1913 AND 1914.

To—	—Plantation—	—Ilveva—
	1913.	1914.
Holland	103,915	1,899,510
Great Britain	133,093	1,802,295
Belgium	.....	500,115
Rest of Europe	6,316	19,514
United States	1,901	31,559
Singapore	1,839	32,430
Other countries	615	2,882
Total	247,689	4,288,305

To—	—Cebu—	—Castillo—	—Others—
	1913.	1914.	1913.
Holland	12,617	134,775	44,684
Great Britain	9,777	30,589	25,800
Germany	.....	6,919	2,735
Rest of Europe	2,996
Singapore	260	631
Other countries	3,080
Total	22,394	165,124	78,034

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Edited by HENRY C. PEARSON—Offices, No. 25 West 45th Street, NEW YORK.

Vol. LII. No. 1.

APRIL 1, 1915.

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Published on the 1st of each Month by

THE INDIA RUBBER PUBLISHING CO.

No. 25 West 45th Street, New York.

CABLE ADDRESS: IRWORLD, NEW YORK.

HENRY C. PEARSON, Editor

Vol. 52.

APRIL 1, 1915.

No. 1

SUBSCRIPTIONS: \$3.00 per year, \$1.75 for six months, postpaid, for the United States and dependencies and Mexico. To the Dominion of Canada and all other countries, \$3.50 (or equivalent funds) per year, postpaid.

ADVERTISING: Rates will be made known on application.

REMITTANCES: Should always be made by bank draft or Postoffice or Express money order on New York, payable to THE INDIA RUBBER PUBLISHING COMPANY. Remittances for foreign subscriptions should be sent by International Postal Order, payable as above.

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Entered at the New York postoffice as mail matter of the second class.

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FOREIGN DUTIES ON AUTO. TIRES.

TIRE manufacturers will undoubtedly be interested in the table given on later pages in this issue showing the duties levied on motor car tires of every sort in the various foreign countries where tires are used. Naturally the most interesting field for the American manufacturer is Europe. It will be noticed that there is a wide range of imposts on inner tubes and casings in the various European countries. Great Britain of course admits them free. Switzerland follows next with a duty so low—only 8 cents per hundred pounds on solid tires and 44 cents per hundred pounds on pneumatics—as hardly to be worth consideration. From this point the duties range upward to that levied by Spain, a country that has no home production to protect but which levies a duty of \$23.64 per hundred pounds on inner tubes and casings. Next to Spain is Russia, with a duty of \$21.39 per hundred

pounds. But of course in Russia there is practically a government monopoly in the manufacture of all rubber goods. Germany requires a payment of \$6.48 per hundred pounds on all inner tubes and casings of foreign manufacture, while France lays an impost of practically twice that, amounting to \$13.13 per hundred pounds.

In South America, where one would naturally suppose the importation of tires as an essential part of trucks and automobiles would be encouraged, the duties run uniformly high. Paraguay taxes imported tubes and casings at \$36.77 per hundred pounds. Chili discriminates between solids and pneumatics, laying an impost of \$19.87 per hundredweight on the first and \$39.74 on the second. Brazil, on the other hand, while permitting pneumatics to enter under a payment of 12.8 per cent. ad valorem, increases the impost to 70 per cent. ad valorem on solid tires, which are classed under the general grouping of "rubber manufactures not specified."

Japan has the distinction of levying the highest specific duty on imports of tires, namely, \$42.92 per hundredweight; but Japan has quite an idea of becoming a rubber manufacturing country and therefore believes in adequate protection.

THE FLYING MACHINE IN WAR.

THE recent manœuvres of Zeppelins over Paris and the threat that with the calmer airs of June they will rain explosives upon London have served to increase interest in these new and spectacular engines of warfare. The chief military service of these ships of the air so far consists of detective rather than destructive work. They have not proved particularly efficacious in the wiping out of battalions; but they have proved exceptionally efficient in locating the hidden enemy and in indicating his position with such accuracy that the gunner back behind the hills could wipe out his battalions—which is quite as effective.

In the construction and operation of this aerial craft rubber plays a dominant part. Several pages are devoted in this issue to describing in detail the extent to which rubber enters into the building of aeroplanes and dirigibles and the manner in which it enables the pilot to keep his working energies in the rarefied atmosphere of great altitudes and even for a considerable length of time under the surface of the sea, in case he falls and is submerged. Aviation in warfare will undoubtedly develop immeasurably beyond its present condition, but it is doubtful if it will ever develop beyond its dependence on rubber.

THE CLEANLINESS OF PLANTATION RUBBER.

THERE is one marked advantage which plantation rubber enjoys over all the varieties that come from the forests, namely, the cleanliness with which it may be prepared. There will be found on another page of this issue certain recommendations recently sent out to the planters by the Rubber Growers' Association, of London. There are twenty-three of these recommendations and it will be noticed that six of them, or over one-quarter of the whole, refer in one way or another to the matter of cleanliness. This shows that in the opinion of the association this phase cannot be emphasized too much.

The necessity is pointed out not only of keeping all chips, shavings and other impurities from the latex as it comes from the tree, but of preserving all cups, utensils and machinery in a constant state of cleanliness. In speaking of the reception of the latex at the factory this rule is laid down: "The latex should be received if possible on a verandah, so that there is no necessity for coolies to enter the building, thus avoiding the presence of dirt in the factory." This seems almost finical, but it shows the extreme care taken on plantations of the better sort to preserve absolute cleanliness in their product. The final injunction refers to the necessity of having the inside of the packing as clean as the rubber.

These precautions can be carried out to the letter on the plantation, but in the forest, where every *seringueiro* is a law unto himself and where it is impossible to supervise him while gathering and coagulating the latex, it is a different story. In cleanliness of product the advantage is obviously with the plantation.

ANOTHER CEMENTER OF SOUTH AMERICAN FRIENDSHIP.

STATESMEN, bankers and business men to the number of many hundreds gathered at the luncheon given by the Pan-American Society on March 19 in honor of ex Senator Burton, of Ohio, who was to sail the next day for a four months' tour of South America for the purpose of additionally cementing the friendship between the republics of the South and ourselves. The term additional is used in view of the similar tours of amity promotion previously taken by distinguished American statesmen.

Some nine years ago Mr. Elihu Root, then Secretary of State in Roosevelt's cabinet, visited practically all the South American governments on a tour of cementation which proved to be a triumph. Later he was followed

in this excellent work by ex-Ambassador Robert Bacon, whose pleasing personality also made an agreeable impression upon our South American friends. Nor should we altogether omit mention of Mr. Roosevelt, who devoted several months to the South American continent a year and a half ago—to be sure, not so much in the interest of trade development as for the purpose of finding a few undiscovered rivers. But his visit served also to develop South American enthusiasm for North American characteristics. And, reciprocally, many leaders from the southern republics have visited us, notably Dr. Müller, who came to our shores a little less than two years ago and graciously endured a volume and continuity of hospitality that would have sent a lesser man to a sanitarium.

It is no fault of the statesmen of either North or South America if the manufacturers and exporters of the United States are not thoroughly alive to the opportunities awaiting them in the southern countries. In fact, the business men of this country as a rule do not require a great deal of assistance to discover opportunities. The reason they have not made a vigorous attack on the South American trade in the past is that they preferred to confine their efforts to the home market as returning a better proportion of profit on the outlay of effort. The Germans and English have secured the South American market because, needing all the markets they could get, they were willing to do the necessary work—to extend long credits, to conform to local customs and, in many cases, even to develop the country's latent resources in order that there might be business to get.

But the war, of course, has changed conditions in South America. The commerce in many of the republics has fallen off disastrously and the commercial situation in many parts of that continent is distressing, and South Americans show an inclination, if not to meet North Americans half way, at least to come a reasonable part of the distance, in an effort to get together. On the 10th of May there will be a Pan-American conference at Washington attended by the financial ministers and leading bankers of the South and Central American countries with the object of increasing commercial relations with the United States; and it will be surprising if, with all the efforts now being made in that direction, trade relations between the two continents do not greatly increase. To be sure, no visible beginning of such a trade increase has yet been made, for during the first seven months of the war—from the first of August, 1914, to the end of January, 1915—exports from the United States to South America decreased from \$80,933,316 for

the same period of the year before to \$45,739,857, a falling off of nearly 44 per cent. But that was due largely to the financial straits in which the South Americans have found themselves since the opening of hostilities in Europe.

However, the establishment of North American banks in Brazil, Argentina and other points is an entering wedge; and when the manufacturers of the United States begin to send their salesmen into these southern parts there is one point that they undoubtedly will all keep in mind, because it has been reiterated so constantly by every speaker and writer on the South American problem, and that is the necessity of having their salesmen carry with them into the southern ports all the suavity and urbanity of which they are possessed. At the Burton luncheon ex-Senator Root, commenting on this matter, said: "Our short, sharp, brusque, but resourceful way of transacting business goes near to the verge and sometimes over the verge of bad manners. The business men of South America are sympathetic and attentive in their business as well as in their social relations." So if the traveling man from the States tries to get South American business by methods that are "short, sharp and brusque," it will be his own fault. He has been amply warned.

COMMENDING OUR NEUTRALITY.

OUR English correspondent, in his contribution to this issue reviewing rubber conditions on the other side of the sea, takes occasion to say that "however much the general American press may have on occasions departed from professions of neutrality, the international subscribers to THE INDIA RUBBER WORLD have found nothing in its pages suggestive of bias to one side or the other engaged in the titanic struggle."

We believe that this statement of our correspondent is entirely in harmony with the facts. While those publications, a large part of whose space is devoted to political discussion, are liable, notwithstanding the best intentions on their part, to be swayed to one side or the other in their attitude towards the combatants in this great war, THE INDIA RUBBER WORLD, being wholly devoted to the development of the rubber industry wherever it has taken root in any part of the world, feels that it would not be justified, even were it so disposed, to take any other than a strictly neutral view of present international conditions.

It hopes, now as heretofore, to be of the utmost service to rubber interests wherever they may be situated and whatever may be their political associations; and it is hardly necessary to add that it will feel an infinite sense of relief and satisfaction when this strife shall cease and the overseer return to the plantation, the chemist to the

laboratory and the workman to the factory—when rubber shall once more move freely and without restraint through the normal channels of commerce and the mills be busy only with those lines of rubber manufacture that contribute to the arts of peace and to the benefit of mankind.

AND NOW A JUNK TRUST!

AND shall the humble rubber shoe, that has weathered the wintry blizzard, the January thaw, the mud of March and the pelting equinox, and at last found a quiet resting place on the dump heap, shall this also fall a victim to the insatiable trust? Evidently the Government thinks that this has already happened, for it is reported that the Department of Justice at Washington has instructed its agents in the West to make a thorough investigation of the so-called "junk trust," to see if its operations and those of its allies and subsidiaries are in restraint of trade. It is to be hoped that the charge is groundless. The merging of all railroads under one control and the concentration of all the banking activities of the country within one institution might be viewed with equanimity, but let us trust that the fender of a choice section of worn-out and discarded tire may still be able to command its full market value and not be compelled to make terms with a grinding monopoly.

THE MICROBE IS NOT GUILTY.

THE unhappy microbe has latterly become a universal scapegoat. When the doctors are put to it to diagnose a case of physical derangement they saddle it on the microbe. And now it is openly charged that when rubber boots and rubber tires do not live up to their guarantees and go to pieces prematurely, the microbe did it. Here is a paragraph which some thoughtless person has started through the rounds of the press: "If your automobile tires or your rubber boots don't wear as they should, it may be because microbes are eating them. Rubber, when sufficiently moist, is frequently attacked by certain bacteria which feed on the albuminoids, resins and sugars it contains. At least two varieties of microbe are able to assimilate the hydrocarbon of rubber and by so doing destroy its value."

A false charge! The microbe is not guilty. To be sure he is not at all averse to crude rubber and is liable under favoring conditions to prey upon its quality. That's quite another matter. But when it comes to boots and tires and other manufactured goods they possess no attraction for him. He does not attack their albuminoids and sugars, for the excellent reason that if they are properly vulcanized they have no albuminoids and sugars. If they have, they are unworthy to be classed with boots and tires and ought to be turned over to the microbes.

The Part That Rubber Plays in Military Aviation.

WHATEVER may have been the popular opinion as to the military value of the flying machine prior to July of last year, there can be no doubt about the important part that aeroplanes have played in the world war. Necessity has compelled the air pilot to take seemingly desperate risks, and in doing this he has gained confidence in his craft and has found many ways in which he could use his vehicle to the advantage of his fellow fighters moving upon the ground.

Today, the warring nations are striving in every way to obtain more aeroplanes, for quite apart from the offensive value of these mechanical birds of man's making, they have the gift of reconnoitring, which either compels extreme efforts towards secrecy on the part of the foe or, this failing, reveals the antagonist's positions and thereby facilitates certainty of attack. In short, the flying machine has more than once broken up the strategic moves of the foe and in this manner has made it more and more difficult for an enemy to surprise. Indeed, it may justly be said that this method of aerial scouting has played a conspicuous part in prolonging the war, because one army's concentration for assault at a supposedly weak point has been promptly met by ample defenders, all because of the spying from above.

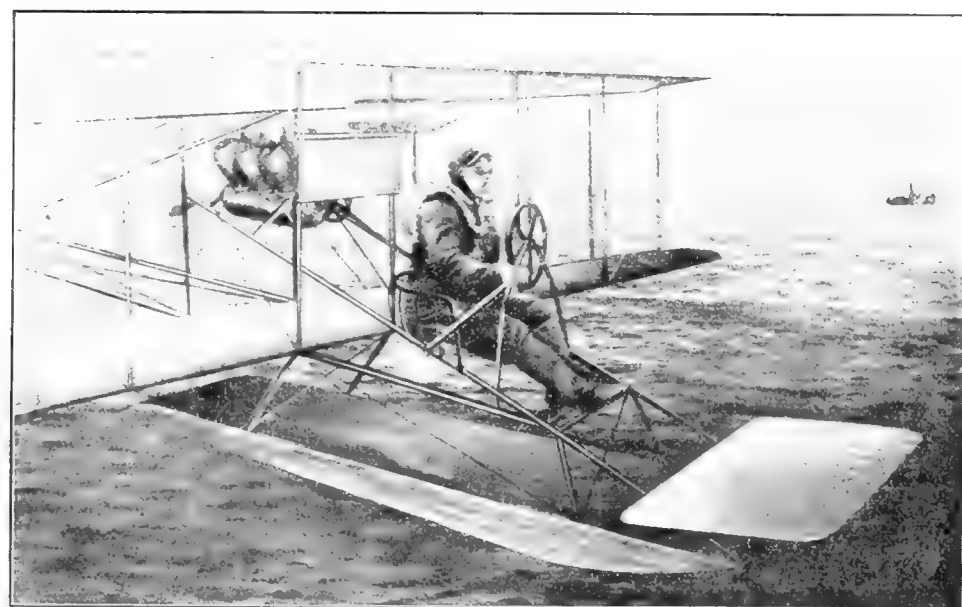
Today, because of strict censorship, it is quite impossible to tell just what is the aeroplane force of the various nations. But, at the beginning of the conflict, the most reliable data gave the following approximate figures regarding heavier-than-air flying machines: France had 1,400 aeroplanes; Germany, 1,000; Russia, 800; Great Britain, 400; Austria, 400; Belgium, 100; and Serbia, 60 aeroplanes. At the same time, the United States could boast the unpretentious array of 23 aeroplanes in the

promised to use her Zeppelin dirigibles offensively and with very disastrous effects, the fact remains that these airships have not figured tellingly up to date, although they have done a minor measure of damage at widely separated periods. But, however, while the Zeppelins have failed to live up to their dire threat, there is no question about the effective work that the dreaded "Tauben" (which means "doves") of the Kaiser's armies have done from time to time. As air scouts and as offensive instruments of war, these flying machines have rendered good account of themselves from the beginning, and their pilots, like those of their rivals, have taken desperate chances in order that this arm of the service might prove its worth.

Undoubtedly the most interesting way in which rubber enters into aviation is its use in the respiratory apparatus, which makes it possible for the aviator to work under atmospheric conditions that normally would render him absolutely helpless. This phase will be described in detail further on. But first consideration may properly be given to the part that rubber plays in the construction of the flying machines themselves. It plays a conspicuous part in both the airship and the aeroplane. True, the Zeppelins use less rubber than other types of dirigibles, because they belong to the so-called "rigid" class, having an external envelope of thin fabric with an aluminum coating, within which are a number of small balloons made of goldbeater's skin—the outside membrane of the large intestine of the ox. But the majority of dirigibles are of the "non-rigid" type; i. e., their envelopes are flexible and are given a measure of semi-rigidity by means of the pressure exerted outward by the buoyant hydrogen gas. For the non-rigid ships rubberized fabric must be used, and while the leakage through this material averages about

one per cent. in twenty-four hours, still it is the best fabric attainable—elasticity under pressure being a prerequisite. The semi-rigid type is really a modified non-rigid dirigible, and here, again, rubberized material is demanded.

As the layman will readily grasp, it is of vital importance that the envelopes should be tough and not liable to tear easily. Accordingly, in the navigable airships of today the fabric is a composite affair, made up of several layers of cloth with layers of rubber intervening. This material is pressed together and vulcanized. Then the stuff is cut to various shapes as the construction of the aircraft demands. In the building of the non-rigid airships for England, the so-called "Continental" fabric used for the envelope is a double diagonal rubberized material, and this is treated with chrome yellow externally to shield the rubber from the effects of sunlight. All seams are gummed with rubber cement. It



THE PILOT OF A GERMAN SEAPLANE PROTECTED BY A COMBINED HIGH FLIGHT AND SUBMARINE RESPIRATOR.

army and navy combined. In the matter of airships or navigable balloons, commonly called "dirigibles," the comparative resources were as follows: Germany, 40 dirigibles; France, 22; Russia, 18; Great Britain, 9; Austria, 8, and Belgium, 2 dirigibles. Like Mother Hubbard's cupboard, our air fleet contained none of these.

While Germany from the very beginning of hostilities has

is said that it is easier to repair the envelope of the non-rigid airship than to mend the outer covering of a Zeppelin. Indeed, while the elastic envelope seldom lasts more than three years, still it can be replaced at a comparatively moderate outlay—estimated at less than \$2 per square meter. It is the practice to place the warp and weft of rubberized fabrics so that the threads of each layer are diagonal to those of the contiguous

layer. This is what is termed "diagonal doubling," and makes a very sturdy material.

In addition to the use of rubber in the envelopes, rubberized cloth is used as a weatherproof covering for the suspended car hanging below the envelope of the dirigible. Further, rubber in the form of tubing is used at various points to take the rub of ropes and stays where surfaces are exposed to chafing. In the big dirigibles there is a sound-proof chamber for the wireless operator, and, as we already know, hard and soft rubber figure extensively in electrical installations of this sort. Rubber tubing and rubber packing are employed in connection with the propulsive motors and the gasoline feed, and, of course, the crews of navigable airships all have weather clothes of rubberized material.

As the reader will realize, the individual aeroplane has much less need for rubber cloth than the dirigible airships of the non rigid or semi-rigid types, but the wing fabric must be waterproof; otherwise the material would absorb rain or moisture and add an appreciable percentage of dead weight to the equipment to just that extent increasing the load upon the motor and altering the pilot's problems of control. Here, again, rubber helps out as nothing else will, and this is particularly the case with the seaplane or flying-boat. In the Curtiss aircraft of this sort, the wings are composed of a framework of laminated wood, fastened with copper straps at the joints, over which is fastened rubber-coated fabric. Indeed, this same material is used for the rudders, the elevator planes, and kindred surfaces, and in the other types of military flying machines rubberized cloth is used to protect the pilots and passengers. The yoke by which the aviator manipulates the wings, by swinging his body from side to side, is very frequently cushioned with rubber; and the steersman's grip is also often coated with the same material. As in the dirigible, stays are covered with rubber tubing at points to prevent chafing, and rubber tubing and rubber packing lend their services in connection with the motors and fuel supply system. In aeroplanes equipped with wireless, rubber does duty again in the form of insulation, and in the latest of these military flying machines it plays its part in the telephone system by which the pilot and his passenger can communicate with each other, despite the noise of the propeller, the roar of the engines, and the deafening rush of the passing wind.

The military aeroplane would be of doubtful use if it could not rise from the ground quickly or make a successful landing after a reconnoitring flight. These machines weigh quite a ton as a rule, and it is something of a problem to bring a body as heavy as this to a halt when landing at any speed admitting of proper control. Remember that these air scouts cannot count upon smooth roadways from which to make their starts nor turf-covered level stretches for their landing. They must take the ground as they find it, and this requires a good deal of ruggedness in the supporting chassis with its wheels. Therefore, in order to reduce the landing impact to a minimum, and, on the other hand, to facilitate getting up sufficient speed for the initial rise, the wheels of the chassis are equipped with resilient tires of rubber. Thus this buoyant material is indispensable to getting the airman aloft and to making his return to ground a safe one under normal circumstances.

We have made no mention of the very latest improvement in

mechanical flight; that is, the automatic stabilizer. But Americans should be proud of what has been accomplished in this direction by Elmer A. Sperry through his gyroscopic apparatus. Compressed air and electricity are his motive agents for this wonderful steadying mechanism, and the precision of operation and the manner of its general functioning hinge to a goodly extent upon the aid lent by rubber in one direction or another.



THE OXYGEN OUTFIT RESTORING AN EXHAUSTED AVIATOR.

The man on the left has a respirator by which he can work in foul air or go into the gas bags of an inflated war balloon for the purpose of making repairs.

Tubing, packing, and insulation are needful to the gyroscopic stabilizer's construction, and rubber meets these demands best.

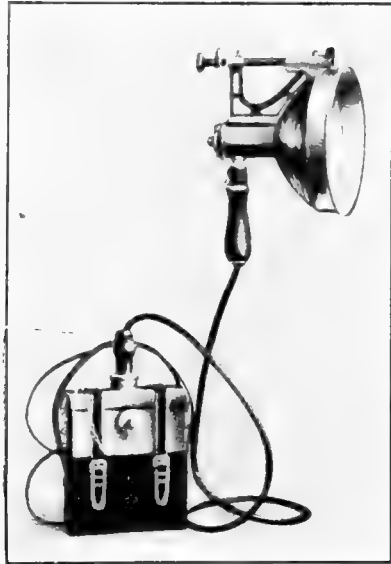
But, as already said, the most interesting contribution rubber makes to aviation is the part it plays in the mechanisms that make it possible for the aviators to breathe comfortably in the rarefied air of great altitudes, and even under the water, in case they fall and are temporarily submerged. These mechanisms, depending for their effective operation on the liberal use of rubber, enable the aviator to utilize his full energy of body and mind under conditions which without this apparatus would render life impossible. It is the miraculous exploits which the aviator, with the aid of science, is able to perform that make the strongest appeal to the imagination.

Perhaps a recent incident may be cited, showing the dramatic side of this service. Captain von Falkenhayn, the son of the noted German general of that name, went aloft in a "Taube" to reconnoiter the position of the Allies, near Amiens. He was overtaken by a French aviator as he was returning to his own lines. Suddenly, he swung in his flight and turned back upon his foe, who was just about to fire, and there in the air occurred a duel between the two pilots. A chance bullet struck the captain in the heart, and immediately he plunged with his unguided craft to the earth.

In a duel of this sort, the effort of each antagonist is to mount above his rival so that the pilot below shall be blanked by the wings of his own machine and thus hampered in firing at his foe. Often, in this struggle for the ascendancy, the rival aviators will mount thousands of feet into the air, and where the temperature may be bitterly low. The Germans have made special provision for this exacting service, and rubber figures in the ingenious apparatus which makes it possible for the Kaiser's aeronauts to meet the physical hardships which this duty imposes. Cold soon saps the energies of a human being and, at the same time, renders the sufferer incapable of performing his work effectively. The hands become numb and are unable to operate levers, etc., by which a flying machine is controlled.

Again, long flights, with accompanying chill, weaken the aviator, and this exhaustion may come at a crucial stage of his journey, high aloft.

Respirable air is normally composed of 21 parts of oxygen and 79 parts of nitrogen. Nitrogen is much lighter than oxygen, hence the force tends to rise just as the latter is disposed to settle and to cling to the earth's surface. The higher one mounts, the greater the percentage of nitrogen, and the less that of the vitally necessary oxygen which helps in body-building, heat making, and blood cleansing, hence the risks run in ascending to great heights.



PORTABLE SIGNAL LAMP FOR AVIATORS.

To meet this situation, the Kaiser's air pilots are supplied with small reserve tanks, holding compressed oxygen, and the rubber hose leading therefrom is attached to a mouthpiece, also made of rubber, hanging within easy reach of the aviator; or, again, in another form, can be attached to the head and placed over the nose and

mouth before the airman mounts skyward. All he has to do is to turn a little valve and at once he is stimulated by this concentrated breath of life. If he is cold and numb, inhaling the oxygen for a few moments will suffice to excite the circulation of the blood and to carry a sense of warmth to the very extremities of his body. But the airman has reason to fear water, and more than one of them have already been drowned by dropping into seas, lakes, and rivers during long flights. Some of the German air pilots who have caused alarm in England have fallen into the North Sea and the Channel, but these aviators are safeguarded, both for work aloft and against accidental dropping into the water. The German pilots are able for a limited time even to breathe beneath the surface of the sea. The airman caught in the rigging of his wrecked machine and held under water, instead of struggling violently and thus hastening his end, can now work deliberately for a considerable interval in getting clear of the tangle in water, can breathe submerged by reason of the emergency apparatus now supplied him, for half an hour. When released for this purpose, the same equipment can be drawn in to furnish the exhausted aeronaut with a safety auxiliary for ascent.

The service consists of an oxygen tank having a storage capacity of 60 litres, a caustic soda solution for the cleansing of the exhaled air, an elastic breathing tube of india-rubber slung over one shoulder, and the connecting tubes and mouthpiece we have already described. The

exhausted air passes through the cartridge, where it is freed of carbonic acid gas, then, mixed with new oxygen from the metal cylinder, flows thence into the breathing sack. In the mouthpiece are two cleverly arranged valves, by which the circulation of the exhalation and the respirable air is maintained. The whole outfit is attached to a life-belt or vest of rubber, which fits the aviator like a jacket. This safety coat serves the double purpose of a warmth-giving outer garment and a life-belt.

This jacket does not interfere with the aviator's freedom of movement. Upon his chest are the caustic soda cartridge and the oxygen flask, which are of such form and size that they do not hamper him. Should the airman drop into the water he can instantly place the breathing pipe in his mouth and open the valve controlling the supply of oxygen. This done, the rest of his jacket, filled with air, will hold him afloat indefinitely.

A somewhat similar equipment has been designed for the officers and crew of the great Zeppelins of the German air fleet. Because of their enormous sizes, these dirigibles are likely targets for the guns of an enemy when sailing low, especially in the daytime. Therefore, it is necessary that the Zeppelins, for their own security, should always travel at much greater heights than the more active and the comparatively small aeroplane. Besides this, the men in the dirigibles must be exposed to the cold for longer periods than the pilot of a flying machine, hence it is of the utmost importance that officers and crews should have safety equipments from which they can draw invigorating oxygen from time to time. A simpler form of the mechanical respirator has been devised for the dirigibles; but, again, india-rubber is indispensable for the air-bags, the connecting tubes, and the mouthpiece.

From a military standpoint, these protective auxiliaries are demanded, because the slower-moving and bulky Zeppelins cannot dodge the agile aeroplane, but must seek to gain the better of it by soaring to greater heights and thus either get the "drop" on the flying machine or "freeze out" the pilot so that he won't dare follow to the dizzy altitudes. At this stage of the game the people on the air-ship must have more oxygen than the enveloping atmosphere contains, and it is then that the respirators are called into service.



A MILITARY MOTOR VEHICLE FOR TRANSPORTATION.

There are other directions in which india-rubber is lending its peculiar characteristics towards making dirigibles and aeroplanes more effective. It will be remembered that when the German armies dropped bombs on some of the English coast

towns during the night of January 19, their approach was heralded by short and long flashes—the dots and dashes of a signal code by which the aircraft maintained communication with one another and, it is said, also were similarly guided upon that occasion by spies posted on housetops. Be the latter as it may, there is no doubt about the existence of flashlight signal



THE RESPIRATOR FOR HIGH ALTITUDE FLIGHTS IN DIRIGIBLES

equipments for German aeroplane pilots, and these have been of the utmost use both day and night from the very beginning of the war.

A scouting pilot's work would be greatly hampered if he had to return to his base to tell the results of his observations, and this is especially so when helping hidden artillery to find the range of the foe and to plant the projectiles just where they could do the greatest execution. A short time before hostilities broke out, there was perfected in Berlin an electric signaling mirror—in effect a new form of military heliograph by which light flashes could be made by the aviator and similarly answered by his friends on the ground. These flashes can be seen night or day for a good many miles.

Compactness and lightness were recognized essentials. The electricity is stored in batteries carried in a knapsack which can be strapped upon the pilot's back, and sufficient energy can thus be furnished for many hundred signals. All of the insulations are rubber. The signaling apparatus is composed essentially of the following parts,—A reflector, an incandescent lamp of high power, a focusing device for the lamp, a directing tube, or aiming tube, and a switch controlling the lighting circuit. A rubber eyepiece is attached to the aiming tube.

The purpose of the aiming tube, which is also equipped with lenses to improve the scope of vision, is to enable the pilot to direct his light-beams with precision upon a chosen point and, at the same time, to restrict the zone in which the flashes can be seen. The way of working is decidedly simple. The operator looks through his tube and aims the lamp just as he would a gun, and then he makes, by his switch key, long and short flashes agreeably to his code. The whole outfit, including the battery, does not weigh quite twelve pounds.

It is not alone in the directions we have already mentioned that India-rubber is sharing in military aviation. The pilots of seaplanes, which must rise from the water and return to the supporting medium from time to time, are protected from neck to foot by a union-suit of rubber, and rubber clothing on a lesser scale is worn by all aviators. Again, the headguards that all air pilots wear to protect the skull from fracture when falling, owe their resilient virtue to thick ribs and bands of the best of soft rubber.

In short with out rubber aviation as a branch of military science would cease to exist.

FURTHER FELICITATIONS ON OUR 25TH ANNIVERSARY.

It will be recalled that in our January issue we devoted several pages to the reproduction of letters that had been received in this office from friends at home and abroad referring to the fact that this journal had completed 25 years of continuous publication. A number of very pleasant tributes have been received since January. Two of these we reproduce below, one from old friends in Germany and the other from our highly esteemed contemporary in France. The first is from Drs. Marckwald and Frank, the German chemists whose work is familiar to everybody interested in the manufacture of rubber.

"To THE EDITOR OF THE INDIA RUBBER WORLD.

In the January number of THE INDIA RUBBER WORLD, which fell into our hands yesterday, we note that on the first of January you were able to celebrate the 25th anniversary of your publication. Although we are late, we do not wish to let this go by without conveying to you our best wishes. We hope that the publication will continue to develop in the next 25 years under the same management.

Owing to political conditions we have not, in the last few months, had an opportunity of communicating with you, but we hope that with the end of this terrible war relations will again be established between the different nations and we will be happy then to correspond more frequently with you.

(Signed)

"Dr. Eduard Marckwald.

"Berlin, February 8, 1915."

"Dr. Fritz Frank.

The second pleasant reference to our 25th anniversary appeared in the February issue of "Le Caoutchouc & la Gutta-Percha":

"In October last our excellent American contemporary reached the 25th year of its existence. On that occasion its friends—and they are innumerable—paid their compliments. Although events have made us very late, we do not wish to miss the opportunity.

"The great American publication, under the masterly direction of Mr. H. C. Pearson, deserves the admiration and the very best wishes of all its contemporaries. It would not be possible to find a more agreeable confrere than Mr. Pearson, and his publication has a distinctive character which places it very high in our esteem. This publication contains the greatest variety of matter, presented in the best manner, without either dullness or pedantry, and with just a touch of that delicious humor which is the heritage of Americans of culture and refinement.

"Our best wishes to THE INDIA RUBBER WORLD! May it continue to prosper under the able management of Mr. Pearson, to whom we extend our compliments and heartiest congratulations."

PROPOSED RATE INCREASE ON TIRES.

The railroads are making efforts to increase the rate of freight on shipments of pneumatic tires in carload lots, by transferring these from class three to class two of their rate schedules. This change would mean an increase in freight charges on tires over and above the five per cent. general increase consented to by the Interstate Commerce Commission.

Tire manufacturers consider this additional increase as quite unfair, especially in view of the fact that tires have materially decreased in value since the third class rating was fixed, and, together with automobile manufacturers, they are protesting through the National Automobile Chamber of Commerce. Mr. J. S. Marvin, general traffic manager, National Automobile Chamber of Commerce, has taken up the matter with the railroads.

The transfer of pneumatics from third to second class would apply only to transportation in the East, and would not affect the rates west of Chicago. This transfer would mean an increase from New York to Chicago of about 15 cents per hundred pounds on shipments of carload lots.

Foreign Import Duties on Motor Vehicle Tires.

THE table given below shows the rates of duty on tires for motor vehicles of all descriptions, including motorcycles, imported from the United States into foreign countries.

The column marked "Tariff No." gives, for convenient reference, the paragraph covering tires in the original tariff.

The classification column indicates how the rates on tires for motor vehicles are classified in the original tariffs. In reference to those marked "Articles Not Specified" it is not to be inferred that an article so described is necessarily included in the blanket clause "Articles Not Specified." Assimilation is widely practiced in foreign tariffs and articles are frequently associated with those which they resemble, either in composition or use, even though not strictly covered by the wording of the corresponding item of the tariff. Articles covered by customs decisions and customs practices, rather than by definite tariff schedules, are printed in italics.

The column marked "Weight" shows whether duties are levied on net or gross weight or include simply the inner packings.

NORTH AMERICA.

Country	Tariff No.	Classification Under Which Tires Are Rated	Weight	Rate per 100 lbs. U. S. Currency	Rate per cent. ad Valorem
Cuba	592	Tires of rubber, fitted or not	Net	35	
Mexico	634b	Rubber tires, with or without inner tubes	Net	\$16.70	
	632	Articles of india rubber, not prepared for work, including inner tubes	Net	11.38	
Newfoundland	95	Automobiles, and parts for same, including tires	Net	49.5	
British West Indies		Articles not specified		13.33	
Bahamas		Articles not specified		20	
Barbados		India rubber manufactures		11.25	
		Articles not specified		10	
Bermuda		Articles not specified		10	
Dominica		Articles not specified, including tires		12.5	
		Articles not specified		10	
Guatemala		Articles not specified		16.66	
Jamaica		Articles not specified		13.33	
Montserrat		Articles not specified		11	
St. Christopher Nevis		Articles not specified		15	
St. Lucia		Manufactures of rubber		12.5	
St. Vincent		Articles not specified		10	
Trinidad and Tobago		India rubber manufactures		10	
Turkey		Articles not specified		10	
U. S. Possessions		Articles not specified		10	
Denmark West Indies		Articles not specified		12.5	
St. Croix		Articles not specified		6	
St. Thomas and St. John		Articles not specified		6	
Dutch West Indies		Articles not specified		3	
Aruba		Articles not specified		3	
Curaçao		Articles not specified		3	
St. Eustatius		Articles not specified		3	
St. Maarten		Articles not specified		3	
East West Indies	626	Pneumatic tires, casings and inner tubes	Net	13.13	
St. Helena	620	Rubber tires, including tubes for tire pumps	Net	8.75	
	620	Articles not specified, including tubes for tire pumps	Net	7.88	
East West Indies		Articles not specified		25	
Dominican Republic	10.4	Articles not specified	Net	36.29	

Haiti	1518	Articles not specified, including solid and pneumatic tires	Net	26.2
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CENTRAL AMERICA.

British Honduras		Articles not specified	Net	12.5
Costa Rica	68	Rubber tires for automobiles and other vehicles	Gross	4.22
Guatemala	1119	Iron cycles of all kinds, including solid or pneumatic tires	"	7.21
Honduras	2565	Vehicles, such as automobiles, and tires therefor	"	4.28
Nicaragua	1484	Motor cycle tires	"	5.72
	1493	Tires for motor cars and omnibuses	"	3.81
	1492	Tires for commercial motor vehicles	"	2.86
Panama		Articles not specified	Net	15
Salvador	259	India rubber tubes, including tires for automobiles, cycles, etc.	Gross	14.08

SOUTH AMERICA.

Argentina	363	Casings, including solid tires	(*)	10.51
	364	Inner tubes	(*)	10.51
	365	Non-skid attachments	(*)	7.88
	372	Other parts, including tire protectors of leather and metal	(*)	12
Bolivia	227	Articles of india rubber, including solid and pneumatic tires	Gross	20.29
Brazil	806	Pneumatic tires for automobiles		12.8
	1033	India rubber and gutta percha manufactures not specified		87.2
		From United States (preferential rates)		70.7
Chile	423	Rubber tires, solid	(*)	19.87
	424	Pneumatic tires	(*)	39.74
	3217	Cycles with pneumatic or solid tires	Net	24.83
Colombia	851	Rubber tires, solid or pneumatic	Gross	0.93
	854	Wheels for automobiles or other vehicles with or without rubber tires	"	0.93
Ecuador	14	Rubber tires	(*)	9.96
Paraguay	283	Casings		36.77
	284	Inner tubes		36.77
	285	Non-skid attachments		27.58
	1089	Rubber tires for automobiles		36.77
Peru	1763	Rubber tires for bicycles, etc.	(*)	36.42
	1767	Rubber tires for automobiles	Gross	24.28
Uruguay		Articles not specified, including motor cycles and tires	Gross	39.5
Venezuela	225	Rubber tires	Gross	10.28
British Guiana		Manufactures of india rubber		16.5
Dutch Guiana		Articles not specified		10
French Guiana	620	Pneumatic tires, casings and inner tubes	Net	13.13
	620	Brake shoes and solid tires	"	8.75
	620	Tubes for tire pumps, etc.	"	7.88

(*) Including inner packing.

EUROPE.

Austria-Hungary	320c	Pneumatic tires (casings and inner tubes)	Net	13.81
	551	Wheels for bicycles, finished, imported separately, each not more than 6 1/2 (19.84 pounds), or including tire, 12 kilos (26.45 pounds): With pneumatic tires	"	1.84
		With pneumatic tires	"	2.21
		Tire protectors of leather	"	6.91
	344	Solid tires	Net	5.69
Belgium	10	Pneumatic tires: Casings with studded leather band	"	11.38
		Other casings	"	10.16
		Inner tubes	"	14.88
Bulgaria	313	Manufactures of india rubber, including casings and inner tubes	Net	5.35
Cyprus		Articles not specified		10

Recommendations for the Treatment of Latex and Curing of Rubber.

THE Rubber Growers' Association, of London, has prepared a number of recommendations covering all the important features of securing the latex and curing the rubber. These recommendations have been printed in the form of a banner 2 feet long by 13 inches wide and given permanency by being backed with linen and finished top and bottom with brass edging, the intention being, evidently, that the banner shall hang on the wall for easy reference. This

will undoubtedly prove a great convenience to the workmen in the factories on the plantation, as the instructions which they should follow will always be immediately under their eye. As a matter of fact, an intelligent workman in a short time is likely to have these rules for preparing rubber, given, as they are, in condensed form, indelibly impressed upon his memory.

The recommendations are reproduced in full below.

THE RUBBER GROWERS' ASSOCIATION (INCORPORATED).

RECOMMENDATIONS FOR THE TREATMENT OF LATEX AND CURING OF RUBBER. COMPILED BY THE UNIFORMITY COMMITTEE FROM INFORMATION SUPPLIED BY THE SCIENTIFIC STAFF.

GENERAL.

- 1.—CUPS, BUCKETS AND OTHER UTENSILS should be selected with a view to ease in cleaning and should be kept absolutely clean. Vessels made of copper, or any alloy of copper, and kerosene tins or receptacles with similar angles should be avoided.
- 2.—WATER IN CUPS.—In most cases addition of water is quite unnecessary. A little clean water may be used in very dry weather, when the latex tends to coagulate very quickly. In some instances a little formalin or sodium sulphite (*not* bisulphite) may be added, *but application should be first made to the laboratory for advice before using these reagents.*
- 3.—WATER ON THE TRANSVERSE CUTS is not advisable. Often the latex coagulates as a result of employing water on fresh cuts.
- 4.—BARK SHAVINGS and other impurities should not be allowed in the cups or buckets.
- 5.—COLLECTION OF LATEX.—Latex should not be allowed to stand in the field. The earliest opportunity for collection should be taken. It is recommended that in collecting, the following grades be recognized and kept separate:
 - (a) Clean uncoagulated latex.
 - (b) Lump, coagulated in the cups;
 - (c) Rinsings from the cups.
- 6.—TRANSPORT OF LATEX.—Every possible means of facilitating quick transport should be taken. When distance of transport is great, out-station coagulating houses should be erected.

IN THE FACTORY.

RECEPTION OF LATEX.

- 7.—PRELIMINARY TREATMENT.—The latex should be received if possible on a verandah, so that there is no necessity for coolies to enter the building, thus avoiding the presence of dirt in the factory.
- 8.—SUPERVISION.—The reception of latex should be under direct European supervision. Causes of defects in preparation of the finished rubber are thus often detected.
- 9.—CLEANLINESS in utensils and methods is absolutely necessary; any neglect in this respect is sure to detract from the quality of the rubber.
- 10.—STRAINING OF LATEX should be thorough, care being taken to see that the mesh is in good order.
- 11.—BULKING OF LATEX is strongly recommended. The mixing of all latex undoubtedly tends to produce a rubber of greater uniformity.
- 12.—SODIUM BISULPHITE.—For crepe manufacture dissolve $\frac{1}{2}$ lb. of the powder in 1 gallon of water. This will be sufficient for 40 gallons of undiluted latex. The solution should be well stirred in after bulking and before the addition of acid. Larger quantities of sodium bisulphite are quite unnecessary. Sodium bisulphite should not be used in making sheet rubber.

NOTE.—Latex containing more than 35 per cent. of rubber may be taken as "undiluted latex."

COAGULATION.

- 13.—COAGULANT.—Acetic acid is recommended as the best coagulant at present.
 - 14.—STRENGTH OF SOLUTION.—Stock solutions should be made up as follows:
 - (a) FOR MAKING CREPE.—Take one part of concentrated acetic acid, of 98 to 100 per cent. strength, and dilute it with 20 parts of pure water.
 - (b) FOR MAKING SHEET.—Take one part of concentrated acid, of 98 to 100 per cent. strength, and dilute it with 200 parts of pure water.
- If in making these stock solutions a more diluted acid be employed such as an acid of 80 per cent. strength, a proportionately greater amount of acid must be taken, thus with an 80 per cent. acid 1 $\frac{1}{2}$ parts must be taken instead of one part.
- In effecting coagulation the maximum amounts of these stock solutions, which need never be exceeded, are:
- (a) FOR CREPE.—1 part of stock solution to 50 parts of undiluted latex.
 - (b) FOR SHEET.—1 part of stock solution to 5 parts of undiluted latex.
- It will frequently be found that less than these amounts is enough to produce complete coagulation, and the minimum amount which is effective should be ascertained by trial.

If the latex has been diluted, a proportionate reduction in the amount of the coagulant may be made: thus if 50 gallons of pure latex have been diluted up to 100 gallons by adding water, then only one part of stock solution (a) need be used for 100 parts of such diluted latex.

- 15.—MIXING OF ACID AND LATEX should be thorough. This is best effected by means of broad wooden paddles. Sticks must not be allowed for this purpose. When making sheet the scum should be removed and added to the lumps;

(a) For the preparation of crepe rubber or sheet rubber in coagulating tanks any quantity of latex may be coagulated in bulk.

(b) For sheet rubber when ordinary dishes are used not more than 50 gallons of latex should be treated with acid in one batch, as the latex sometimes coagulates before all can be poured out into the dishes. It is sometimes convenient to add water to the latex or to use a diluted solution of formalin to prevent rapid coagulation. *In such cases add only a small quantity to the laboratory.*

PREPARATION OF RUBBER.

- 16.—AFTER-CURING WORKING.—The extent to which rubber is worked on the machines should be the minimum found necessary.
- 17.—THE THICKNESS OF THE RUBBER determines the rate of drying. Pale crepe should be rolled out thin for drying, especially for artificial drying, and this can subsequently be worked into blanket crepe if desired. Sheet rubber when dry should not exceed $\frac{1}{8}$ in. in thickness.
- 18.—SMOKE CURING.—Sheets should always be as uniform in thickness as possible, and the period of smoke curing should also be uniform. Sheets not exceeding $\frac{1}{8}$ in. thickness should usually dry in 9 to 10 days.

NOTE.—The best temperature for smoking is 120 deg. to 130 deg. F.

OFFICES

CREPE		SMOKED SHEET.	
<i>Defects to be avoided.</i>	<i>Preventatives.</i>	<i>Defects to be avoided.</i>	<i>Preventatives.</i>
(1) OILY STAINS.	See that oil from the bearings does not get on to the rubber. (a) through use of too much lubricating oil. (b) through worn bearings. These should immediately be replaced, as oil from worn bearings contains particles of copper or verdigris, which gradually eat into the rubber and reduce it to the consistency of treacle. (c) by taking care that the crepe does not come near the edge of the rolls or other parts of the machinery which may be oily. Trays under the washing mills should not project beyond the ends of the rolls.	(7) MOTTLEDNESS.	Efficient smoking (see also under (8)).
(2) DARK STREAKS.	Avoid oxidation and surface darkening of portions of the coagulated latex by the use of a little sodium bisulphite in the latex (for proportion, see paragraph 12 above). Do not allow the rollers to grind against each other.	(8) RUST (STRETCH-ING, CRUSTY, RESINOUS, OR TACKY).	The sheet should be scrubbed down with a stiff brush and plenty of water a few hours after rolling, allowed to drip for one hour, and then put into the smoke-house. If the latex is very rich, dilution with water before coagulation to a proportion of 1½ to 2 lbs. of dry rubber to the gallon is recommended.
(3) MOTTLED SPOTS AND DISCOLORATION.	Keep the crepe thin and do not hang it too closely in the store so that the rubber dries quickly. In case of persistent spot trouble, apply to the laboratory.	(9) OVER SMOKING (DARK GLOSSY SURFACES).	This may be caused by the use of too large a proportion of cocoanut husks, rubber seed or similar oily material. The timber used should not be wet and the fires must not be allowed to burst into flame. Do not use cocoanut oil for smoking.
(4) MOTTLEDNESS.	Proceed as in (3) and see that the rubber is thoroughly dry before packing.	(10) TAR DEPOSITS.	See that the roof of the smoke house does not drip owing to condensation.
(5) COTTON FLUFF.	Do not use cotton waste for keeping the oil off the rolls. If a pad is necessary, use one of cloth or flannel. Avoid using too much oil.	(11) THICKENED EDGES.	Take care that the edges are not doubled over in rolling, as this gives sheets of an uneven thickness and liable to cut virgin.
(6) TACKINESS (HEAT AND STICKINESS).	See that rubber is not exposed to direct rays of the sun. Scrap should be brought in and washed as soon as possible if there is unavoidable delay in washing, the scrap should be kept in water.		

CARE OF MACHINERY.

20. MACHINES must be well cleaned and inspected each day before commencing work. At frequent intervals (say, once a week) they should be well cleansed of all traces of oil by means of a 5 per cent. solution of caustic soda. This must be applied under European supervision, by means of a cloth fastened to the end of a stick. Afterwards the machines should be set in motion and the water allowed to run for some time, say ten minutes.

21. LUBRICATION. The engine driver, or other responsible person, should do this work.

22. WORN PARTS must be replaced at once. Worn bearings are often the cause of "green streaks" in crepe rubber. When the grooves of rolls have become worn they cease to grip the rubber thereby reducing the output of the machine and overworking the rubber.

SORTING AND GRADING.

23. Great attention and careful supervision are necessary for these operations. The fewer grades the better, and the regularity of each grade is most important.

The perfect assortment should consist of:

No. 1.—Fine Sheet or Fine Crepe	Made from the tree or liquid latex
No. 2.—Clean light brown Crepe	Made from lumps, which cannot go through the strainer, and skimmings.
No. 3.—Scrap Crepe	Made from tree scrap
No. 4.—Dark Crepe	Made from bark shavings and the lower quality of scrap crepe.

Earth rubber and any tacky rubber should be packed separately.

Color—evenness is most desirable and any discolored or mottled pieces must not be left in the first quality.

No. 2 clean brown crepe, no grit or minute pieces of bark should be left in the rubber.

All pieces of scrap showing the slightest traces of heat must be picked out.

The Crepe usually known on the market as "specky brown" is often insufficiently washed; bark or other impurities left in the rubber reduces the value.

No. 4 the lowest grade, naturally, varies very much and special attention to washing is most advisable.

Smoked Sheets should only be of one quality. Any sheets oversmoked or showing imperfections should be packed separately.

PACKING.—Opinions differ as to the suitability of cases employed, but there is no doubt that the wood must be planed, so that no splinters can get into the rubber.

As a general rule, the three-ply wood cases specially made for rubber are the most desirable. Care should be taken to see that the inside of the package is thoroughly clean before packing.

12 x 19 x 24 inches measurement and capable of holding up to about 200 lbs. is recommended for sheet.

21 x 21 x 24 do do do do about 155 do do crepe.

Other cases which have proved satisfactory are the Japanese Momi and the Cochin case. Ordinary (local) native made chests are undesirable. Rubber should never be packed in bales.

N.B.—Consumers' worst enemy in Rubber is heat and stickiness, a very little of which will often spoil an otherwise good parcel.

38. EASTCHEA.

LONDON: F. C.

January, 1915.

The Rubber Growers' Association, of London.

THE most impressive feature of the entire rubber industry during the last ten years has been the extraordinary growth of the product of the rubber plantation. If anyone were disposed to question this statement he has only to look at the tabulation of plantation production. Ten years ago, in 1905, the sum total of plantation rubber amounted to 145 tons. In 1914 it had reached 70,000 tons, with the probability that the production for the present year will equal 85,000 tons. This certainly is a phenomenal development, and some of it at least is due to the excellent work of that strong and efficient organization, the Rubber Growers' Association, of London.

This association was formed in June, 1907. A number of men interested in the plantation industry were called together at that time by Mr. John McEwan. Among those who responded to his call were Mr. H. K. Rutherford, Sir William Hood Treacher, Mr. A. Bethune, Mr. W. F. de Bois Maclaren and Mr. T. C. Owen. Mr. H. K. Rutherford was elected the first chairman of the association, which started with a membership of 60, representing 23,000 cultivated acres. Up to that time the interests of the rubber planters had been looked after in a general way by the Ceylon Planters' Association, in London, which concerned itself with the welfare of tea planting and other activities on the island; but as the Eastern rubber production of the preceding year, 1906, had reached a total of 510 tons, with the promise of extremely rapid growth, it was thought that the time had arrived for a separate organization that should concern itself solely with rubber production.

The necessity for such an association is shown in the production figures of the next few years. In 1907 plantation rubber amounted to 1,000 tons; the next year it almost doubled, reaching 1,800 tons; the next year it doubled again, reaching 3,000 tons, while in 1910 there was more than 100 per cent. increase, the production for that year reaching 8,200 tons.

For the first six years of its existence the Rubber Growers' Association was housed with the London Chamber of Commerce, and a few years after the foundation of the association its increasing membership and the importance of the matters with which it had to deal necessitated its incorporation under the companies act, as the association could no longer carry on its work as an unincorporated body. Accordingly, in 1912, the association was duly registered as a company, limited by guarantee, and a license from the London Board of Trade was obtained to dispense with the use of the word "limited" in its title.

In the following year it was decided that the work of the

association should be conducted with its own staff and in its own offices. The association was thus placed in a better position to deal with the increase in the work which has resulted from the rapid development of the rubber growing industry.

The membership of the association is now 638, consisting of 407 companies and 231 individuals. The constituent companies represent a total issued capital of £85,000,000, and own 2,459,015 acres, of which 746,478 acres are planted in rubber.

The extraordinary growth of this association, from an initial membership of 60 to its present membership of over ten times that number, and from an initial representation including less than 25,000 cultivated acres to a present cultivation of thirty times that area, proves at once the need for such an organization and the efficiency with which it has been conducted. Its chairmen have included, in addition to Mr. Rutherford, first chairman, and



JOHN MCEWAN.



EDWARD L. HAMILTON.

Mr. John McEwan, who served last year, Mr. A. Bethune, Mr. Richard Magor and Mr. Noel Trotter, all men of sterling character and exceptional ability.

The work of the association covers everything connected with the rubber plantation, reaching from such small details as perfecting scientific instruments for use in the testing laboratory to proper sanitation and matters of freight and export duty, and even following the rubber until it reaches the sales rooms in London. Perhaps the association's most important work in the East is in connection with the administration of the two research funds, which consist of amounts guaranteed by companies operating, respectively, in Ceylon and the Federated Malay States. The guarantors to these funds receive the benefit of the research and advice of resident chemists, mycologists and factory advisers, and have the exclusive right to their regular private and confidential reports. The work done by these funds is of vital importance to the industry.

The last annual meeting of the association was held on February 18 last. The association's report for the year 1914 is a quarto of 56 pages, and shows by its size and by the variety of topics covered the wide area of the association's activities. It is an interesting report, but even more interesting was the address delivered at the meeting by the chairman, Mr. McEwan, which, owing to space limitations, can only be referred to briefly here. He spoke at length about the very strenuous and arduous work of the association and its committees necessitated by the outbreak of the war. He referred to the rubber exhibition held in London last July and spoke very pleasantly of the acquaintance that occasion afforded an opportunity to make with the American rubber men who participated. Mr. McEwan referred quite

humorously to synthetic rubber, in the following paragraph:

"The old bogey of synthetic rubber has been trotted out once more during the year, or rather a new one under the old name. It looked more serious because there was evidently substantial financial backing, but the same melancholy interment closed its career. Its chief service was to furnish a peg for writers and orators on rubber topics to hang jokes on, while the extensive derelict factory built to produce it was commandeered by the war office, with the intention of housing therein several thousand German prisoners. Threats came from Germany that the chemists there would really at last invent synthetic in retaliation for our stopping their supplies of crude rubber. We are still waiting for it, and so are the German and Austrian cities, in which motor cars and taxicabs are rapidly disappearing from the streets."

Another particularly interesting paragraph in his address referred to the extension of uses to which rubber could be put. He said:

"The advent of the war has prevented us gaining the benefits from various efforts made to promote the use of rubber in new directions, and has interfered with some schemes. The government departments cannot suspend work on the war to test untried inventions. There are many such in various stages of development. There is the rubber so treated that it is to make vessels unsinkable. There is the buffer of rubber that when collisions occur at sea is to give only a gentle and friendly tap, unless in the case of an enemy submarine.

"There is the sheathing of rubber for battleships from which the enemy's shot and shell will rebound, and like an Australian boomerang with damaging effect return to its source. There are the rubber-studded blocks for fixing steel rails in their chairs, to replace the wooden keys now in use. Above all, there are the rubber roadways which the council have undertaken with a view to meet the many calls for more silent and more durable streets."

The Annual Report has an additional interest in the patriotic service which it shows the association has performed while at the same time extending the uses of rubber. In the fall it furnished the government with a particularly complete ambulance, supplied with a number of special features, such as rubber buffers and stops, rubber flooring and hot-water bottles, for use in the British expeditionary force. It also supplied the Australian navy with 4,000 rubber life-saving collars, in recognition of the good work done for British commerce by the destruction of the "Emden"; and it further appealed to the members of the association to contribute scrap rubber for hospital flooring. One hundred and sixty-nine companies contributed over 45,000 pounds of rubber, which was made into flooring for a number of London hospitals.

At its annual meeting a new chairman was elected for the coming year—Mr. E. L. Hamilton, who had previously served as vice-chairman of the association. Mr. Hamilton is a director in many large plantation companies in British Malaya and combines a practical knowledge of planting with conspicuous business ability.

The association during the last year, and particularly during the last eight months, has shown great efficiency under most trying conditions, and there is just ground for the optimism regarding its future shown by the chairman in his annual address and by others who followed him on that occasion.

MR. EDWARD L. HAMILTON.

The new chairman of the Rubber Growers' Association, of London, Mr. Edward Lawrence Hamilton, celebrated his 57th birthday on the 4th of March, last. After being educated at the Portora School, he entered business in 1876, at the age of 18. Two years later he went to Calcutta and joined the firm of Hoare, Miller & Co., East India merchants, becoming a partner in that house in 1885, and senior partner in India 10 years later.

He retired in 1900, and in the same year became a partner in the firm of Parrott & Co., San Francisco; but in 1903 he returned to England and assumed the management in London of certain large estates in the Malay Peninsula. He is now very widely interested in the rubber industry of the Middle East, being chairman of 14 planting companies, namely, Straits Rubber, Rubana, Selaba, Tali Aver, Glenshiel, Kurau, Bagan Serai, Batak Rabbit, Sungei Purun, Cheras, Merchiston, Orient Trust, and Windon. In addition, he is a director of 6 other companies, as follows: Penang Rubber Estates, Rubber Plantations Investment Trust, Chersonese Malayan Rubber and Produce Company, Djasinga Rubber and Produce, Gula-Kalumpang, and Merchants' Marine Insurance Co.

So it is very evident that as chairman of the London association he is a worthy successor of the distinguished leaders in the planting industry who have hitherto occupied that office.

RUBBER STATISTICS FOR THE UNITED KINGDOM.

CRUDE RUBBER.		1913.		1914.	
IMPORTS FROM	QUANTITY	Value.	Quantity.	Value.	
French West Africa	1,009	\$1,386,018	681	\$290,681	
Peru	1,301	2,168,907	692	905,548	
Brazil	11,768	28,910,417	12,385	16,709,522	
Gold Coast	667	715,851	252	223,801	
Straits Settlements and F. M. S.	15,103	25,773,987	21,143	25,541,064	
Federated Malay States	9,880	17,189,319	9,821	12,227,081	
Ceylon	6,705	11,238,325	9,361	11,329,329	
Other countries	19,391	12,497,313	13,686	9,857,068	
Total		65,824 \$99,880,138		67,622 \$77,086,854	
EXPORTS					
Russia	6,354	\$10,731,630	7,507	\$9,053,452	
Germany	9,729	16,267,323	7,073	8,233,558	
France	5,308	9,132,016	4,936	6,300,443	
United States	17,791	26,362,448	24,179	28,775,153	
Other countries	5,830	9,709,916	5,379	6,622,645	
Total		45,012 \$72,202,333		49,074 \$58,985,221	

GUTTA PERCHA.		1913.		1914.	
Total Imports	5,562	\$6,669,869	2,617	\$3,018,325	
Total Exports	444	\$43,773	443	\$77,328	

MANUFACTURES OF INDIA RUBBER.

IMPORTS	QUANTITY	Value.	Quantity.	Value.	
Apparel, water-proofed	95,771	\$31,545		\$41,151	
Boots and shoes		\$83,596	85,348	706,678	
Tires and tubes for motor cars		12,447,504		9,210,153	
Tires and tubes for motor cycles		460,388		193,312	
Tires and tubes for cycles		\$45,505		\$80,478	
Tires and tubes unenumerated		41,901		\$8,052	
Total		\$14,138,895		\$10,688,824	
EXPORTS					
Apparel, water-proofed		\$4,071,009		\$3,765,109	
Boots and shoes	134,314	671,000	131,390	604,035	
Tires and tubes for motor cars		3,449,979		2,504,301	
Tires and tubes for motor cycles		1,067,882		323,885	
Tires and tubes for cycles		601,503		1,617,415	
Tires and tubes unenumerated		648,646		\$24,024	
Rubber manufactures, except water-proofed apparel, boots and shoes, tires and tubes		8,060,121		5,732,211	
Total		\$14,900,546		\$13,070,881	

WATERPROOFED APPAREL.

EXPORTS TO	QUANTITY	Value.	Quantity.	Value.	
France		\$10,000,000		\$130,539	
British South Africa		177,757		70,121	
British East Africa		7,855		137,746	
Austria		90,377		334,181	
New Zealand		71,004		100,437	
Canada		1,373,049		904,230	
Other countries		7,504,478		1,807,555	
Total		\$14,900,546		\$3,765,109	

ELECTRIC WIRES AND CABLES, INSULATED.

IMPORTS—	QUANTITY	Value.	Quantity.	Value.	
Submarine cables				\$9,741	
Other telegraph and telephone wires and cables		\$87,651		238,327	
Rubber insulated wire and cable		1,843,661		1,194,594	
Total		\$931,561		\$1,442,662	
EXPORTS—					
Submarine cables		\$1,654,401		\$2,384,896	
Other telegraph and telephone wires and cables		7,461,683		1,528,402	
Rubber insulated wire and cable		65,179		1,648,094	
Total		\$14,779,244		\$5,561,392	

A Review of Recent Progress in Rubber Chemistry—III.

Contributed.

The author of this paper, a well known rubber chemist, submitted it, not as in any way a descriptive article, but merely as an index of progress during the last two years. To elaborate it and make it a readable article would necessitate the use of many hundreds of pages.

ANALYSIS OF RUBBER AND COMPOUNDS

THE methods used for rubber analysis in the Bureau of Standards at Washington have recently been published. (THE INDIA RUBBER WORLD, December, 1914, p. 126.) The report of the Joint Committee on Rubber Insulation Analysis has been published in the Journal of Industrial and Engineering Chemistry (vol. 6, p. 514, and THE INDIA RUBBER WORLD, April, 1914, p. 329). The Bureau of Standards has also published a method of determining caoutchouc by direct combustion. (THE INDIA RUBBER WORLD, September, 1914, p. 649.) Felix Jacobson (THE INDIA RUBBER WORLD, December, 1913) has given the standard method of analysis adopted by the General Electric Engineering Association of England. W. Jones (THE INDIA RUBBER WORLD, September, 1913) and H. Loewen (THE INDIA RUBBER WORLD, December, 1913) have written on the errors of the usual acetone determination. Holt (Zeitschrift Analytischer Chemie, vol. 27, 1914, p. 115) gives methods for caoutchouc and gutta percha determination. H. Loewen, commenting on Jacobson's method for fillers cited above, says that by using paraffine oil heated to 230 deg., rubber sometimes separates out, but with petroleum of B. P. 170 deg. nothing settles out. (India Rubber Journal, 1914, p. 83.) M. Vellery (Moniteur Scientifique, 1913, vol. 3, p. 82) claims that saponification will determine fats, factice and resins in insulation, if Koetstoffer's method is used. Goldberg (Gummi-Zeitung, 1913, vol. 11, p. 85) claims that combustion in a combustion tube is accurate for carbon determinations in insulation. C. Harries has done much work on the identification of the eight-carbon ring, which we have previously referred to. It is also used as a method of analysis. Later he used the identification of the eight-carbon ring to determine the constitution of reclaimed rubber. This same author lately has made dioctyl-propane by analytical methods from the ozonides.

DETERMINATION OF SULPHUR.

E. Deuser (THE INDIA RUBBER WORLD, December, 1913) has a method of determining sulphur by forming the nitrosite, dissolving this in sodium carbonate, evaporating and reducing to sulphides and determining sulphur colorometrically. Herbert Hodgson, of the Northern Polytechnic School, England, has given a long review (India Rubber Journal, 1914, p. 315) of the various methods of determining sulphur and prefers the Kaye and Sharpe method. Kirchof (THE INDIA RUBBER WORLD, June, 1914, p. 400) has studied the addition reactions. Stevens (Journal of the Society of Chemical Industry, 1914, p. 268) gives the sulphur method for rubber. Utz gives his method for sulphur (Gummi-Zeitung, 1914, p. 1634). L. Archbutt (Journal of the Society of Chemical Industry, 1914, p. 34) claims 8 hours' acetone extraction is sufficient.

J. B. Tuttle and C. E. Waters (Journal of Industrial and Engineering Chemistry, vol. 3, p. 734, comprising the matter in Circular reprint No. 174 of Bulletin, vol. 8, No. 3, United States Bureau of Standards) gives results of experiments on the various sulphur methods. Their conclusions are as follows:

1st. Treatment of rubber with nitric acid alone gives low results.

2nd. The Heubener method cannot be employed on the presence of fillers like lead and barium compounds, which give insoluble sulphates.

3rd. The Fusion method gives close results. The van't Kruls method gives high results.

4th. The best method is to use nitric acid saturated with bromine.

O. Lichtenberg (Gummi-Zeitung, November, 1914, p. 222)

gives a contribution on the hydro-halogensulphides of rubber and their thermal dissociation. W. Schmidt (Journal of the Society of Chemical Industry, 1914, p. 614) gives bromine methods. A. G. Harries (Journal of the Society of Chemical Industry, 1913, p. 372) describes more work on halides. F. Deussen (THE INDIA RUBBER WORLD, December, 1913) gives method of determining rubber by nitrosides.

FILLERS AND THEIR ANALYSIS

A. Schaeffer (THE INDIA RUBBER WORLD, April, 1914, p. 340) describes sublimed white lead. Gilbert Riggs and Dr. Stone (THE INDIA RUBBER WORLD, May, 1913, p. 414) describe lithopone and zinc oxide. Frank and Marekwald show the injurious action of copper on rubber. (THE INDIA RUBBER WORLD, August, 1914, p. 600.)

The Rubber Growers' Association, in the "Planters' Chronicle," has recently called attention to the ruinous effects of very small quantities of copper on the coagulation of latex. Acetic acid used for coagulation, if distilled in a copper worm, will contain injurious amounts of copper.

Utz (THE INDIA RUBBER WORLD, February, 1914, p. 224) gives a method of analysis of golden sulphite of antimony. W. Schmidt (India Rubber Journal, 1913, p. 83) has also discussed this subject.

Frank and Marekwald (Gummi-Zeitung, p. 1584) have given a method of analysis for sulphur chloride.

F. Fritz states (Journal of the Society of Chemical Industry, 1914, p. 34) that Para rubber seed oil has an iodine value of 141, converts easily into lynoxlin and is suitable for linoleum manufacture.

HALOGEN COMPOUNDS AND NITROSITES AND OZONIDES.

These compounds are frequently made in the analysis of caoutchouc. F. W. Hinrichsen (Report 46, p. 1203) describes hydrohalides made from the acid gases. Mono and Di-compounds were made with ice; without it hexa and tetra compounds (Harries, Journal of the Society of Chemical Industry, 1913, p. 372) were made. Bromination in chloroform solution in ice gives always the tetrabromide. The halogens cannot always be entirely removed by alcoholic potash, in boiling solution. In repeating Weber's experiments only a green substance containing from 6 to 14 per cent. of iodine was obtained.

C. R. Boggs gave a method of determining rubber by means of its tetrabromide, at the Eighth Congress of Chemistry at New York, 1912 (vol. 9, p. 45, Report). G. Heubner (Gummi-Zeitung, vol. 28, p. 1214) has a new bromination method. Vaubel and Weinerth (Gummi-Zeitung, vol. 28, p. 92, 1913) give results of using the bromination method.

W. A. Ducca (Journal of Industrial & Engineering Chemistry, vol. 4, p. 372) has described various methods of determining the caoutchouc in raw and vulcanized rubbers. He reviews Weber, Harries and Alexander, and concludes that the nitrosite method is of no value for determining caoutchouc but is valuable for determining the co-efficient of vulcanization.

He also reviews Budde, Harries, Rampel, Hinrichsen, Kind-scher, Axelrod and Heubener on bromination. His own results were always high, as it is impossible to remove excess of bromine by hot water. G. Heubener (India Rubber Journal, 1914, p. 224; Gummi-Zeitung, vol. 28, p. 320; Kolloid Zeitschrift, 1913, p. 53; India Rubber Journal, 1913, p. 22) gives results of work on bromination method and criticizes Ditmar, Caspari and Kirchof.

W. Schmidt (Journal of the Society of Chemical Industry, 1914, p. 614) brominated with potassium bromate and bromide in hydrochloric acid aqueous solution as per Vaubel's method and found five instead of six atoms of bromine absorbed in the caoutchouc molecule. He used penta-chlor-ethane as solvent. K. Utz (Gummi-Zeitung, 1912, pp. 968 and 468, and 1914, vol. 28, p. 631) states that the determination of bromine in caoutchouc-tetrabromide gives wrong results. He used the methods of Baubigny and Chavanne (Journal of the Society of Chemical Industry, 1913, pp. 761 and 1018, and 1914, p. 136) and suggests further work on the Heubener method using this bromine method as previous criticism was based on the fusion method for bromine (Kolloid Zeitschrift, 1913, vol. 12, p. 54).

L. G. Wesson (Journal of Industrial and Engineering Chemistry, 1914, p. 459, and THE INDIA RUBBER WORLD, September, 1914, p. 649) has published methods of determining rubber having approval of the United States Bureau of Standards. R. Becker (Kolloid Zeitschrift, vol. 12, 1912, p. 54, and Gummi-Zeitung, vol. 26, p. 1503) works with the Heubener and Budde methods and cautions against under-bromination.

RUBBERS OTHER THAN PARA.

The rapidly falling prices of plantation rubber have served to lessen the interest in all other than Para rubber of either the wild Brazilian or the cultivated plantation variety.

Guayule: Owing to the disturbed conditions in Mexico this is not at present an important article of commerce. F. E. Lloyd (Journal of the Society of Chemical Industry, February, 1914, p. 107) has shown that this is primarily a desert plant and when it is planted in a rainy district or when water is supplied to it by irrigation it grows rapidly, but the rubber content may decrease as much as 62 per cent. The resins do not seem to be affected by the rainfall.

Kickxia Elastica: D. Spence and W. F. Russell (Chemical Abstracts, 1914, p. 4085) show that this is fairly good rubber if properly worked. Frank and Marckwald had previously condemned it (Gummi-Zeitung, vol. 27, p. 2087) and they deny that they had improperly treated it.

Funtumia: Buel (Le Caoutchouc la Gutta Percha, 1913, vol. 10, p. 6884) gives results of tests of this rubber as well as of herb and weak Para. These results do not seem important or conclusive.

Manihot: Fenkender (THE INDIA RUBBER WORLD, April, 1914) has written on this rubber.

Apocynaceae and Euphorbia: A French patent issued to C. E. Anquetil claims coagulation of these latices with benzol and acetic acid.

Asclepias rubber: THE INDIA RUBBER WORLD, 1914, p. 645, has discussed this.

Tinias: A rubber fruit. This has been described by A. Dubosc (Chemical Abstracts, 1914, p. 425).

Ceara and Rambong: Beadle and Stevens (Chemical Abstracts, 1913, p. 1622) have described these.

As above remarked, these rubbers are of scarcely any present interest.

NORTHERN RUBBER-BEARING PLANTS

In recent years a number of northern plants of the milk weed family and other latex-bearing varieties have been investigated by various American chemists. Charles Fox at the Eighth International Congress of Chemistry (see Proceedings, vol. 25, p. 593) described Osage orange latex, which did not seem to produce rubber. The same author (Ohio Naturalist, vol. 11, p. 271) described the rubber obtained from milk weed; and A. C. Meisch, in an address before the Chemists' Club in New York City (Journal of the Society of Chemical Industry, 1913, p. 72) also described this rubber. Charles Fox also described lettuce rubber from the *Dichotoma* (Journal of Industrial & Engineering Chemistry, vol. 5, p. 477).

NEW RUBBER PRODUCTS.

Rubber Foam: This subject seems to have attracted some at-

tention recently. United States patent No. 1,038,950 granted to E. P. Farmer, for manufacturing rubber froth, claims vulcanizing partly under high pressure, then releasing so that the gas will swell it into froth, then it is further vulcanized. United States patent No. 1,089,482 to E. Seaman claims the manufacture of rubber foam by adding carbon disulphide and a processed rubber, then adding sulphur chloride, the latter evidently to give a cold vulcanization. United States patent No. 1,115,031 has been granted to Gray Staunton, of Muskegon, Michigan, claiming the production of rubber sponge or foam. (THE INDIA RUBBER WORLD, December, 1914, p. 131, and January, 1915, p. 197; also Scientific American, September, 1914, and January, 1915. This method depends on mixing the rubber with hydrocarbon solvent and submitting it to a vacuum to puff the rubber up, after which a cold cure is given.)

A. Dubosc (Le Caoutchouc la Gutta Percha, vol. 10, p. 7639) has described mossy rubber.

Balloon Fabrics: K. Memler and A. Schob (Materialsprüfung, 1912, No. 4, p. 202) describe bursting tests on this material, and the "London Times" Engineering Supplement had a review of this subject recently (Journal of the Society of Chemical Industry, vol. 32, p. 282). Dr. Heubener (Chemical Abstracts, 1913, p. 2693) has described the manufacture. The system of testing used in the Goodyear Tire & Rubber Co.'s works has been fully described by R. A. D. Preston (THE INDIA RUBBER WORLD, November, 1914, p. 69).

PHYSICAL TESTING OF RUBBER

Probably no industry is so dependent on physical tests in connection with the chemical tests of its product as the rubber industry. The testing of balloon fabrics has been before referred to (THE INDIA RUBBER WORLD, November, 1914, p. 691). Memler and A. Schob (Materialsprüfung, 1912, vol. 4, p. 202) describe bursting tests on balloon fabric at Gross Lichterfeld. The Bureau of Standards has in Circular No. 38 described some tests for rubber. (THE INDIA RUBBER WORLD, December, 1914, p. 126.)

The Société D'Encouragement pour l'Industrie Nationale, of Paris, has awarded a medal to Chéneveau and Heim (THE INDIA RUBBER WORLD, November, 1914, p. 108) for a recording dynamometer by which stretch and hysteresis may be determined.

Earl L. Davis, of the Goodyear Tire & Rubber Co.'s laboratories, has recently discussed (Journal of Industrial & Engineering Chemistry, December, 1914, p. 985, and Journal of the Society of Chemical Industry, 1914, p. 992) the mathematical formulas which Chéneveau and Heim developed. (Bulletin de La Société D'Encouragement pour l'Industrie Nationale, Paris, vol. 120, July, 1913, p. 20). Davis used, however, the Schwartz Rubber Testing Machine. His experiments show that the actual measurements of the curves compare very closely with the computations, and he urges that these values be standardized in specifications for various stocks.

Bethune (THE INDIA RUBBER WORLD, 1914, p. 384) has discussed the standardization of rubber. Spence and Young (Chemical Abstracts, 1913, p. 1107) have devised an apparatus for hot vulcanization by which uniform conditions may be secured for each test sample vulcanized. P. L. Wormeley (THE INDIA RUBBER WORLD, 1913, p. 412) has discussed tension tests.

FACTICE.

Ditmar (THE INDIA RUBBER WORLD, June, 1914, p. 481) records numerous experiments and tests on this material, and Vaubel (Gummi-Zeitung, vol. 27, p. 1254) analyzes samples and speculates on its composition.

(To be continued.)

INSULATING PROPERTIES OF SOLID DIELECTRICS.

In the January issue of this publication, on the page devoted to rubber chemistry, there was a partial reproduction of a table showing volume resistivity of solid dielectrics which appeared in a paper, "Insulating Properties of Solid Dielectrics," by Harvey L. Curtis, Associate Physicist of the Bureau of Stand-

ards at Washington, and published as No. 234 of the "Scientific Papers of the Bureau of Standards." Unfortunately, however, in the composition of this table an error was made which, while easily detected by those familiar with the subject, was liable to be misleading to many readers. The table is consequently inserted again in correct form and is as follows:

VOLUME RESISTIVITY OF SOLID DIELECTRICS.

Material	Resistivity Ohm-centimeters.
Special paraffin	over $5,000 \times 10^{15}$
Ceresin	over $5,000 \times 10^{15}$
Hard rubber	$1,000 \times 10^{15}$
Clear mica	200×10^{15}
Sulphur	100×10^{15}
G. E. No. 55 R.....	40×10^{15}
Hallowax No. 5055 B.....	20×10^{15}
Bakelite No. L 558.....	20×10^{15}
Shellac	10×10^{15}
Sealing wax	8×10^{15}
Moulded mica	1×10^{15}
Unglazed porcelain	300×10^{12}
German glass	50×10^{12}
Plate glass	20×10^{12}
Opal glass	1×10^{12}
Black condensite	40×10^9
White celluloid	20×10^9
White galalith	10×10^9
Blue Vermont marble	1×10^9
Ivory	200×10^6
Slate	100×10^6

THE OBITUARY RECORD.

THOMAS MILBURN UPP.

THOMAS M. UPP, writer, naturalist, and for the last two years a member of the staff of THE INDIA RUBBER WORLD, passed away March 8, 1915, at Tompkins Corners, New York.



THOMAS M. UPP

At the time of his death he was alone, his wife being in Seattle, attending the golden wedding of her parents. His house took fire in the early morning hours and burned to the ground with the unfortunate owner in it.

Mr. Upp was born in Iowa some forty years ago and passed his youth in the West, but a number of years ago moved to the East and engaged in newspaper work on the New York dailies. But he was naturalist even more than journalist and could not resist the call from the forest and the hillside. Some nine years ago, therefore, he purchased a

farm at Tompkins Corners—not with the intention of farming but simply to live in the midst of nature.

He was a naturalist, geologist and astronomer of repute. His book reviews and critical articles were always excellent, while in regard to work he had few equals. Active, aggressive, and lively, he was a firm friend, a charming comrade, and one who will long be missed.

Dr. William T. Hornaday, director of the New York Zoological Gardens, an intimate friend, offers the following tribute to his memory:

On an unspoiled and natural mountainside in the Berk-shire

Hills of Putnam County, New York, there lived and died a man who was a poet, philosopher, naturalist and champion of clean politics. The occupant of a modest cottage almost smothered in vegetation, he wielded a pen that sent forth many a broad message of power and influence. When Thomas M. Upp, Justice of the Peace, attacked with his marvelous gift of biting satire an abuser or an abuser, the world laughed and applauded, and the party of the second part turned red and took notice. To be commended by that trenchant pen was indeed an honor.

He was a fellow of infinite jest; of most excellent fancy. His humorous poems were works of art. First of all, he was the friend and defender of nearly all wild life. He demanded that even the pilot blacksnake should have a square deal. The birds, wild flowers and trees were his most intimate friends, and the ruthless destroyers of them he regarded as his enemies.

With an excellent knowledge of astronomy, on which for years he wrote popular articles, the heavens declared to him the glory of God and the firmament showed His handiwork. Born and reared on the prairies of Iowa, when Iowa was the "the frontier," he grew up close to nature. His soul was full of poetic imagery, and his verses were in every sense real poems. The fire which destroyed both his home and his life took from us a large collection of original verses of which no copies remain.

Mr. Upp's greatest single achievement was the stamping out in Putnam County of the vote-selling evil, and it well illustrates the power of one determined citizen who is right and who is inspired by a high motive. Alone, single-handed, without financial resources and with no assistance save the publication of his articles in the Carmel newspapers, Mr. Upp set on foot and carried through to success, in 1913, the movement that ended in Putnam County a long-standing disgrace.

ALBERT GOOSS.

The German rubber industry lost one of its veteran members in the death of Albert Gooss, manager of the United Rubber Goods Manufacturing Co., Harburg-Vienna, which occurred February 22 last. Mr. Gooss was the son of a Hamburg merchant and had been actively connected with the rubber industry for the past 47 years, entering it in 1868 as a clerk in the United Rubber Goods Manufacturing Co. In the course of his career he was connected with the Continental company in Hanover, and founded the Saxon-Bohemian Rubber Goods Manufacturing Co. in Dresden. In 1897 Mr. Gooss became manager of the Hanover-Linden Telegraph Works, and when this company was absorbed by the United Rubber Goods Manufacturing Co., in 1898, he retained his position as manager of the Linden plant.

HAROLD L. WAGNER.

Harold L. Wagner, associated for twelve years with Robinson & Co., crude rubber importers of New York City, died on March 24 at his home, 76 Adelphi street, Brooklyn, in his 27th year. Notwithstanding his comparative youth, he was well known in New York rubber circles, and in addition to his business interests was active in the Masonic organization, being a prominent member of one of the Brooklyn lodges.

John G. Holt, a retired rubber stamp manufacturer, died at his home, 88 Madison street, Brooklyn, New York, March 4, at the age of 58 years.

Henry H. Sessions, inventor of the vestibule and anti-telescoping device used on most railroad passenger trains, and of the air brake and other devices for street cars, died at his home in Chicago, March 21, at the age of 67 years.

News has been received of the death of Jacob Musly, who for the last 13 years was one of the partners of the firm of Weise & Co., rubber dealers of Rotterdam and Amsterdam.

A new O'Sullivan rubber heel has appeared on the market, for shoes with Louis heels. It is made in black and tan and in a complete run of sizes from 1 to 5,—the first time, according to the manufacturers, that anything of this kind has been attempted. [O'Sullivan Rubber Co., 131 Hudson street, New York.]

New Rubber Goods in the Market.

RUBBER COATS.

THE work of the clothing designers is now being shown in the new models on the market for the Spring and Summer. Of the number displayed the most novel is the one from which the accompanying illustration was made. This is an all white coat, made of rubberized silk crêpe de chine. It has loose raglan sleeves, one of the new deep collars which can be buttoned up close to the neck or left open, as desired, and is finished with deep pockets and large white pearl buttons. It is extremely light in weight and is suitable for wear over the most delicate costume, on damp days, at the beaches, etc.

The same manufacturers have also introduced a smart rain or traveling coat of rubberized silk crêpe de chine in putty, gray, navy and black. This coat is also loose, an inverted seam in the center of the back giving additional fullness. It has a detachable belt, patch pockets, set-in sleeves and a coat collar which buttons



close to the neck. [N. Y. Mackintosh Co., Mamaroneck, New York.]

In men's coats the military feature of present style tendencies has been brought out, and no matter how much a man may disapprove of warfare generally, or what his personal distaste or unfitness for service, the smartness that the military cape adds to the raincoat is not to be overlooked. The cut shows one of these new effects in waterproof coats.



The third illustration shows a new rubber firecoat. Heretofore firecoats have been made entirely with black rubber both inside and out, with the exception of officers' or chiefs' coats, which have been made with a white coating. This new coat, brought out by a firm specializing in rainproof clothing, is made with a red rubber coating both inside and out and is being sold under the registered trade mark "Red Back." It is not a brilliant red but a deep maroon shade, and the stock has a fine smooth finish. [Stoughton Rubber Co., 232 Summer street, Boston.]



BATHING ACCESSORIES.

"Ocean Millinery" is the aptly descriptive classification under which one manufacturer offers this line of rubber goods for the coming season. A few styles were selected for photographic reproduction from this line, which includes everything in the way of rubber bathing accessories

—caps, girdles, collars, rubber handkerchief bags, garters, flowers, fruit, berries, etc.—all hand made, exclusive in design and entirely of rubber. Of the three styles illustrated. The first cut shows the "Tommy Atkins" cap. This is made of red and blue rubber, the blue band and streamers contrasting effectively with the red cap. The second figure shows a military cap with sash to match. The cap illustrated is made of gray rubber, with an orange band, a blue insert in the front, across which are lacings of black, and a gray and orange military pompon. The sash is of the orange rubber, with tassels of orange and gray.



Both cap and girdle are made, however, in a large number of colors. The third cut shows a cap and girdle with rhinestone decorations. This set, which also includes rhinestone studded garters, is in an attractive shade of gray, but the same style is



made in various colors and shades. [H. C. Studios, 25 West Forty-fifth street, New York.]

Another concern which manufactures art rubber novelties has several handsome new designs on the market, of which two are shown. The first is a rubbered beach cap of college type. The crown is tied in kerchief effect, with upstanding ends trimmed with black pussy willow silk. It is made in black and white, also in deep red and black and in turquoise blue and black. The other is a rubberized bathing cap. The crown, which is made of satin, in red, green, navy or King's Blue, is trimmed

with two "feelers" fastened under a patent leather rosette. The colored crown is gathered into a black shirring. [Stern Specialty Co., 42 East Twenty-second street, New York.]



The third set of illustrations shows new caps on sale in one of the Fifth avenue department stores. These are all made of rubberized material, the first style having a foundation of silk in navy, sand or black, with a band of contrasting color, finished



in front with a buckle. The Scotch cap in the center is also of rubberized silk, in navy, red or black with plaid trimmings, and the third style, which is made in white, black or navy, is trimmed with rubber flowers.

A bathing accessory that will delight the small child at the same time that it appeals strongly to the small child's mother is shown in the accompanying cut. These garments, called "Seasides," are made of waterproof material and are intended to be slipped over the little one's skirt or trousers to protect them from the water while wading or playing around the beach. They are made in red or black, in sizes from 2 to 8 years, and each garment is supplied in a waterproof bag, the manufacturers producing a line of bags in rubberized silk and other materials for carrying wet



garments. [Stern Specialty Co., 42 East Twenty-second street, New York.]

NEW RUBBER TOYS.

Nothing offers greater opportunities to the makers of rubber toys than the reproduction in rubber of the little personages that have become familiar and dear to children through stories of adventure. Probably no modern child's story is more popular than "The Adventures of Peter Rabbit," and every child who has read this story or heard it read will want one of the rubber figures of this funny little fellow, who has been faithfully reproduced in this material, in a figure 5½ inches high, brown in color with a bright blue jacket and with black slippers. The makers are putting out also a "Peter Rabbit Outfit," which consists of this rubber toy and a handsome copy of the Peter Rabbit book, printed in five colors, both packed in a gift box.

Other novelties made by this company are hot-water bottles, in pint, half-pint and quarter-pint sizes, covered with felt on which are printed nursery scenes, animal figures, etc. These hot-water bottles, in addition to serving a purpose as toys, may be put to practical use. [Anderson Novelty Rubber Co., Akron, Ohio.]



A NEW TENNIS SHOE.

Here is a new tennis or outing shoe, the upper of canvas, with perforated saddle strap, counter and lace stay of black or tan Russia calf, and the sole and heel of rubber. The illustration shows an Oxford in this style, but it is made also in high shoes, some of which, in addition to the trimmings mentioned, have leather tips.

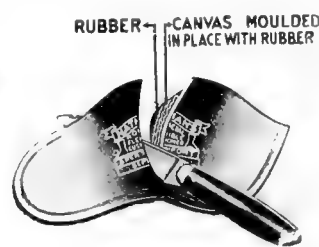


A SHOE MADE OF COTTON AND RUBBER.

A shoe manufacturing concern in the South has recently brought out a shoe made almost entirely of cotton and rubber, the only part consisting of other materials being a thin welt of leather to which the sole is attached. The upper of this new shoe is made of Palm Beach cloth; the sole is of cotton belting, which is declared to possess wearing qualities in this use superior to leather, and the heel is of rubber. [The J. K. Orr Co., Atlanta, Georgia.]

THE NATHAN (NO METAL) ARCH SUPPORT.

This is a flexible cushion that supports the arch without the use of any metal whatever. One of the cuts below illustrates the support cut through the center to show its construction.



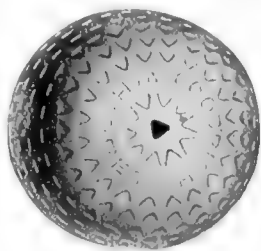
The top outside section is made of Russia calf leather, and the lower section of leather especially prepared to grip the sock lining. Inside this leather case are two layers of rubber, the top or thicker section being of rubber and fabric such as is used in tire construction, molded into the desired shape. Under this is another rubber layer, unmixed with fabric. The molded rubber arch is designed to furnish a strong and elastic support, and it is claimed for the device that it gradually restores the muscles to a normal and healthy condition, by exerting a gentle massage movement through the "give" of the bottom rubber layer. [Nathan Novelty Manufacturing Co., 84-90 Reade street, New York.]



A recently invented device for attachment to phonographs and telephone diaphragms for clarifying the tone by retarding vibration is composed of rubber and celluloid discs and soft paper cushions.

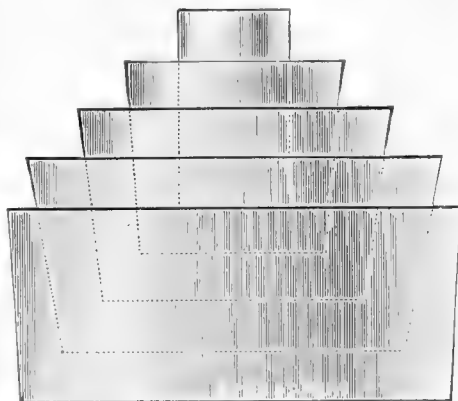
THE WHIPPET GOLF BALL.

The "Whippet" is the newest thing in golf balls, being so constructed, according to the manufacturers, as to combine distance superiority and the inelasticity which the old "gutter" had for putting. It is claimed that the Whippet will outdrive other balls from 10 to 25 yards. This ball is coated with a specially prepared rubber paint, which is said to act like chalk on a billiard ball, preventing it from slipping off the club and giving better control of the stroke. The application of rubber paint to the outside of a golf ball is something entirely new, and its effect, with the feature of inelasticity in putting, make the possibilities of this ball especially interesting to golfers. One expert on golf ball manufacture, in speaking of the Whippet, states that he considers it "the greatest advance in golf ball construction since the introduction of the rubber core." [The B. F. Goodrich Co., Akron, Ohio.]



THE "FITALL" STOPPER.

This is a set of five rubber stoppers or rings, one fitting over the other and all forming one large stopper; or sections may be removed to make stoppers of various sizes, as will be suggested by reference to the illustration. With all five sections in use the stopper is 60 millimeters, or about 2 inches, in diameter. Rings can be purchased separately, or considered. This makes a very useful set, particularly for fitting up special laboratory apparatus. [Eimer & Amend, 205-11 Third avenue, New York.]



A SANITARY INVALID PAD.

Here is a rubber pad for invalids which, while only half the size of the ordinary air bed, possesses certain advantages—one of which is that, as a space is left on both sides, between it and the edge of the bed, there is less liability to puncture. This pad is 48 inches long, a length sufficient to take in the anatomical curves of the body from shoulders to knees, and it can be inflated to conform to the body with uniform pressure. It is 30 inches wide and from a thickness of 4 inches at the head slopes toward the lower end until it is on a level with the regular mattress. It weighs only 5 pounds, and when deflated can be rolled into a package 6 x 10 inches. It is supplied with a detachable cover that can be removed and washed. Such a pad is said to prevent bed sores and to be invaluable in cases of back ache, fracture, shocks, etc. The company makes a similar air mattress in size 19 x 72 inches for ambulances, to relieve jolting and jarring. [Metropolitan Air Goods Co., Reading, Massachusetts.]



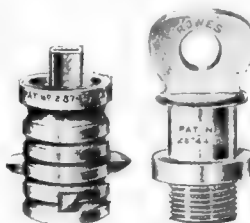
A RUBBER DRIP CUP FOR CANOE PADDLES.

The advantages of the double paddle for canoeing have hitherto been somewhat offset by its one great disadvantage that when the paddle is reversed the water runs down from the blade up the canoeist's arm. By means of the small rubber device shown in the cut herewith, however, this disadvantage has been overcome. This is a drip cup made of rubber, that can be adjusted on the paddle to catch the water as it runs down from the blade. These cups come in pairs, for adjustment one at each end of the paddle where it spreads out into the blade. [Abercrombie & Fitch Co., 53-7 West Thirty-sixth street, New York.]



STOPPER FOR HOT WATER BOTTLES.

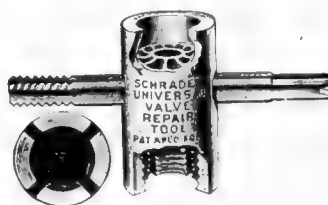
In the use of the hot water bottle the ordinary socket is often loosened because of repeated insertion and removal of the stopper, resulting finally in a leak. Rowe's "Anchor" interlocking stopper fitting overcomes this difficulty. The socket of this stopper has annular grooves and is made with a number of projections which hold it down securely in the neck of the bottle. The bottle is built up on the socket, so that when vulcanized it is impossible for the socket to turn. [T. W. Rowe, London, N. E., England.]



SCHRADER'S NEW SPECIALTIES.

The only sure way of knowing whether a tire has the prescribed air pressure is to test it, a process which involves considerable trouble and loss of time in removing and replacing the screw-threaded dust cap. All the unnecessary expenditure of time and patience involved in the screwing and unscrewing of the dust cap, when the tire is removed for repairs or a new one put on, can now be avoided. Schrader's new quick-acting cap is slipped over the valve, and all that is required to fasten it is a simple quarter turn and it is firmly seated. To remove it, all that has to be done is to give it a quarter turn in the opposite direction.

Another new and interesting Schrader innovation is the valve repair tool. This is really a tap, die and milling cutter, ingeniously combined in a convenient pocket tool. Its uses are varied; for instance, in case the thread in the valve cap becomes damaged, it can be accurately re-threaded by this tool. In case the top of the valve seat becomes roughed up, it can be milled off with this tool, making an air tight seat for the dust cap or testing gage. It also re-threads the inner valve and can be used in an emergency to remove the inner part of the valve without injury.



And still another Schrader valve specialty is the deflating cap, which eliminates the loss of time occasioned by trying to hold down the air valve while deflating the tire. The little cap slips easily over the valve stem and holds it down as the air escapes. [A. Schrader's Son, Inc., Brooklyn, New York.]



Replete with information for rubber manufacturers.—Mr. Pearson's "Crude Rubber and Compounding Ingredients."

NEW TRADE PUBLICATIONS.

THE UNITED STATES RUBBER CO.'S LITERATURE.

THE catalogues and price lists of the United States Rubber Co. were issued this year on March 1 instead of as formerly on January 1. The present output of the publication department of the company consists of 42 different pieces, nine of these being extremely handsome catalogs of a uniform size of $4\frac{1}{2} \times 8$ inches, with highly artistic covers in a variety of colors, while the text is printed on a finely finished paper that secures the best possible results from the many halftone cuts with which the books are illustrated. These nine catalogs cover the nine principal brands sold by the company, namely, American, Bantigan, Boston, Candee, "Glove," Lycoming, Meyer and Jersey, Wales-Goodyear and Woonsocket.

To revert to the covers again, 4 of them have exceptionally appropriate designs, the American catalog showing the dome of the Capitol at Washington, the Boston catalog cover reproducing the historic old State House in Boston, the Wales-Goodyear showing the Polar bear for half a century associated with this brand—strolling very contentedly over a chilly looking iceberg, while the Woonsocket cover depicts an aggressive elephant (appropriate because of the elephant head branded in Woonsocket goods) charging through the underbrush towards a native who is earnestly sprinting for cover.

The halftone cuts bring out all the little details of the different boots and shoes so completely that nothing need be left to the imagination. These catalogs show two features that are new this season, namely, a list of boots, lumbermen's, Arctics, gaiters and shoes made under the "Patent Pressure Process." This process is referred to in the catalogs as follows: "The Patent Pressure Process supplants hand work with an even, accurate pressure of the pure gum and the constituent fabrics, firmly, solidly and permanently uniting all the various parts of the boot or shoe. Patent Process footwear is the most economical that the consumer can buy." Another new feature found in all

in addition, illustrated lists devoted to the "Empire" brand, the "Unika" (tan) brand, the "Everstick" and to miscellaneous goods.

While at first glance one is impressed most by the artistic quality of these productions, what makes the most lasting impression, on examination, is the completeness of the information which these booklets contain. It would seem as if the most inquisitive dealer could hardly ask a question not fully answered in this library of footwear information. To illustrate—picking up one of the books at random, the Wales-Goodyear catalog has 40 illustrations showing the different shapes of soles and heels mentioned in the text. If after reading one of these catalogs carefully the retailer still labors under any misconception on any essential point it must be charged to his own lack of perspicacity rather than to want of perspicuity on the part of the compiler of these books.

REMEMBERING THE CONSUMER ON HIS BIRTHDAY.

It is pleasant, of course, to be remembered at Christmas time—provided the remembrance is a useful one—but it is doubly pleasant to be remembered on one's birthday, as that carries with it the comforting thought that one's natal day is of sufficient importance to be noticed. The Canadian Consolidated Rubber Co., of Montreal, has utilized this theory in a clever advertising campaign. The company's advertising department, by a unique plan described in the January, 1914, number of THE INDIA RUBBER WORLD, informed itself as to the birthday date of a great many thousand users of tires and other rubber goods and, having catalogued this information, has followed it up by sending out every day some token to those whose birthdays fall on that particular date. Last year it distributed birthday cards and blotters. This year it is distributing birthday calendars.

These calendars consist of a sizable pad, containing not only the days of the month but certain modern proverbs and rubber information, fastened on a metallic back so grained as to appear like a panel of olive wood. On the front page of the calendar is printed, "Wishing you many happy returns of"—and then is inserted the date of the recipient's birth. This sort of advertising makes a subtle appeal to one's self-appreciation and will no doubt prove very effective.

A BOOKLET ON RUBBER BELTING AND TRANSMISSION.

Everyone who uses machinery belting is of course more or less familiar with the advantages claimed for rubber belting over belting made of any other material. However, belt users, notwithstanding their general familiarity with the subject, will be interested in the little booklet just issued by the North British Rubber Co., Limited, of Edinburgh, citing the arguments for rubber belting and the proofs of its superiority. Among other claims which they advance is this:

"The transmission of belt power has to do largely with adhesion, and a non-slipping rubber belt always delivers a full measure of power. For such machines as have a quick reverse action the rubber belt in active test has proved superior to leather. Besides the increased grip on the pulley and consequent conservation of power, belts of rubber have the additional advantage of resisting damp and warm atmospheres better than any other. And there comes the question of quality in materials, both in rubber and cotton. Sixty years' experience has shown that reliable belts can only be made by using the best quality of materials."

There are many useful notes for the user of belts, and some practical talks, with illustrations, on pulley covering, belt lacing, splicing, riveting and general rules regarding belting. A simple testing device that can be made by any millwright is shown, and the result in actual figures clearly proves that the resistance of rubber belting to slip is three times greater than that of leather belting—a point of natural interest to power users. The booklet is an excellent example of the



FIG. 1. "S. R. L. C." Arctic

the different brands is the "S. R. L. C." buckle, which is now the standard equipment of the light gaiters made by the different factories and which is also recommended for heavy Arctics and lumbermen's. This buckle is described as an "absolutely secure fastening under all conditions, with no projecting ends to catch in the clothing."

In addition to the 9 illustrated catalogs there are 36 smaller lists ranging from 4 to 24 pages, two sets of 9 each being devoted to the cross price list and the net price list of the different brands mentioned above, while the other lists cover various brands made by the company but to which illustrated catalogs are not devoted, as, for instance, the "Commonwealth and Seaside" and the "New Brunswick" brand. And there are,

printer's art. There are many illustrations, one giving a bird's eye view of the mammoth mills of the company, said to be the largest india rubber manufacturers in the British Empire.

A NEW WALPOLE CATALOG.

Early in March distribution was made of a catalog and price list of manufactures of the Walpole Tire & Rubber Co., of Walpole, Massachusetts. Insulating materials—tapes, liquids and compounds—form the important feature of the catalog, the company having specialized in this line since taking up its manufacture in 1892, having as its aim high and permanent dielectric strength in this product rather than initial insulation resistance. An interesting page is devoted to the manufacture of insulating tape. Directions are given for the use and application of certain materials.

This company also manufactures a wide variety of molded rubber goods, claiming for them the same high standard of quality offered in its insulating materials. Soft rubber bushings for cables and motor leads are illustrated, in addition to springs and bumpers for brakes, car seats, etc., coil cushions, gaskets, valves, etc. Corrugated rubber matting is listed, in thicknesses from 1/16 to 1/2 inch, in rolls of 50 yards or less, and rubber mats in diameters from 7 to 18 inches. A photograph of the plant at Walpole where these various products are turned out occupies the first page of the book.

OLD MAN MILEAGE CALENDAR.

The accompanying cut illustrates a new calendar being distributed by the Republic Rubber Co., of Youngstown, Ohio. This calendar is of the desk variety, a cardboard cut-out supported by a back rest and having a small calendar pad. The figures represent "Old Man Mileage"—less familiarly known as E. Normous Mileage—the quaint character adopted by this company for use in all its advertising, and his dog "Stag," posed beside one of the familiar Staggard tread tires. This group in colors makes an attractive display and is now being used as part of the stage setting in a certain popular vaudeville act.

NEW BEACON FALLS PRICE LIST.

The Beacon Falls Rubber Shoe Co., of Beacon Falls, Connecticut, issued on March 1 its new price list on "Top Notch" rubber footwear. This is a booklet of 40 pages, 4 x 5 1/2 inches in size, and all but five of these 40 pages being illustrated with from one to five cuts. High boots are given first place in the list, followed by the usual lace and buckle varieties and the rubber overs for men, women and children. Three pages at the back of the book are occupied by descriptions and cuts showing sport shoes—basketball, gymnasium, yachting, tango and tennis. Prices are quoted net, and the terms are stated in detail.

The March issue of "R-U-B-B-E-R," the house organ published monthly by the company, describes the "Top Notch" boot as "the lightest, strongest and longest wearing boot on the market," the new process of curing the heavy goods in the line being credited with putting twice the strength and lasting qualities into them and giving them a natural rubber

color. The patented ribbed legs and the heavy rough rubber strip next to the sole are special "Top Notch" features, and red soles are conspicuous in the descriptions.

THE EDITOR'S BOOK TABLE.

INDUSTRIAL CHEMISTRY. A MANUAL FOR THE STUDENT AND MANUFACTURER. Edited by Allen Rogers, Pratt Institute, Brooklyn, in collaboration with 76 scientists of 15 nations, with 1,000 illustrations, departments of chemistry. Second Edition, thoroughly revised and enlarged. D. Van Nostrand & Co., New York. [Large octavo, 1,605 pages, 395 illustrations. Price \$5 net.]

AS its name implies, this volume covers practically the whole range of chemistry. The feature that will be of special interest to rubber manufacturers and chemists is chapter 34, "Rubber and Allied Gums," by Frederic Dannerth. Dr. Dannerth, it will be remembered, was Honorary Secretary of the Rubber Congress, held in New York, in the fall of 1912, in connection with the Third International Rubber Exposition, and he has contributed more or less regularly for several years to the literature of rubber chemistry.

Twenty five years ago it would have been impossible to produce a book like this—the work of such a large number of specialists. At that time if a manufacturer wanted information on chemical matters he was very likely to resort to the nearest college and get into conference with the professor of chemistry or his assistants and to lay before them the problem that confronted him. In this way the college professor of chemistry in many instances developed a fairly lucrative practice as an expert in the chemical questions connected with the various industries. But since that time the science of industrial chemistry has enjoyed a great development and become a distinct and recognized profession, until now every important branch of industry can boast of a large number of specialists who devote their whole attention to the chemistry of that particular branch. That makes it possible today for the editor of such a book as "Industrial Chemistry" to bring to his assistance specialists of recognized standing in all the different industries in which chemistry plays any part.

In the 20 pages allotted in this volume to the chemistry of rubber Dr. Dannerth has succeeded in covering a great deal of ground. He starts with the botany of rubber, mentions its geography, describes the extent of its commerce and devotes a number of interesting paragraphs to plantation development. He then takes up as thoroughly as space will permit the chemical characteristics of crude rubber. He also covers briefly the subjects of reclaimed rubber, organic fillers, mineral fillers and solvents. He discusses the process of coagulating, describes and illustrates with a number of halftone cuts the methods of washing, milling, mixing and calendaring rubber, explains the process of vulcanization and gives a list of the more important articles manufactured from rubber. He also succeeds, in a few words, in giving a good idea of what has been done in the way of synthetic production of rubber. He adds brief paragraphs on balata, jelutong and chicle. The author has shown great skill in getting so much information in so few pages.

There are other chapters in the book which will interest many rubber manufacturers; for instance, those on "Oils, Fats and Waxes," by Carleton Ellis; "Resins and Oleo-Resins," by Allen Rogers; "Shellac," by A. C. Langmuir; "Gums and Gelatin," by Jerome Alexander, and "Casein," by E. L. Tague.

GERMANY RESTRICTING USE OF AUTOMOBILES TO SAVE TIRES.

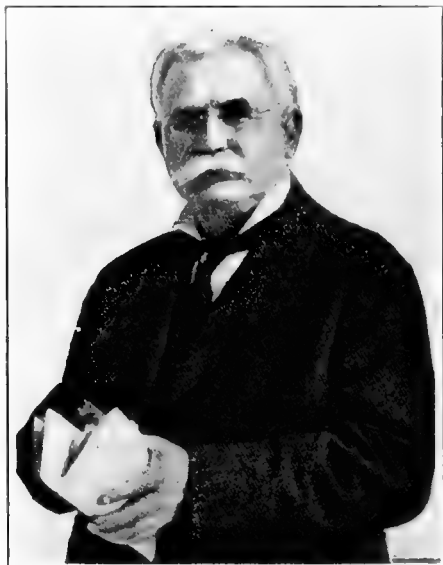
By an order issued by the Bundesrat, Berlin, beginning March 15 all automobiles must have new licenses, and licenses will be issued only when it is proven that public necessity for them exists. This order will probably reduce by at least one-half the number of automobiles in use in that country for other than military purposes, the object being to curtail as much as possible the consumption of rubber tires, gasoline and lubricating oils.



ALPHONSE MAJOR, THE MAKER OF CEMENTS.

ONE day, forty years ago, two young men, who had for a long time been inseparable companions, became stranded down in Texas. One of them possessed the secrets of what he claimed to be a valuable recipe. His companion purchased this recipe with one of his few remaining dollars, and the two young men separated to seek their fortunes single-handed.

The new possessor of the secret formula made his way eastward by slow degrees until he reached the city of Balti-



ALPHONSE MAJOR.

more. Here he purchased small quantities of a few ingredients, and as an experiment he made the first batch of his mixture in an old tomato can.

The next day the citizens on the streets of Baltimore stopped to gaze in astonishment at a young man standing beside a tripod, from which was suspended a two-hundred pound weight supported only by two pieces of glass cemented together. This young man was Alphonse Major, and this was the beginning of the Major Manufacturing Co.

Even with this modest but novel method of introducing the new product, it was not long before the qualities of Major's Cement became recognized, and he was soon able to establish a small shop for its manufacture at 232 William street, New York City.

For some time Mr. Major manufactured only cement for china, glass, etc. But one day he received an order for rubber cement, which, of course, he did not have. However, the suggestion caused him to investigate, and he learned that rubber cement was then coming into great demand. Accordingly, he began the manufacture of this product, and it was received with such favor by the trade that he followed it a short time later by the addition of gutta percha cement. Mr. Major began the manufacture of rubber cement in 1878; so he has now been engaged in this branch of his business 37 years. In addition to a large domestic trade he ships considerable quantities of his rubber cement every year to Canada and Europe.

Alphonse Major, a native of Canada, was born in 1848, and despite his sixty-six years, he is still the active head of the concern which bears his name, and which is now located at 461 Pearl street, New York City.

Like the name of many another American product, Major's Cement has become a household word. The little blue porcelain advertising signs are to be seen in almost every town in the country.

Mr. Major is still active as the head of his sales organization and personally calls upon the trade. His rubber cement, which, he points out is made of the finest Pará rubber, has found a wide use in millinery and hat manufactories, as well as in other lines well known to all rubber men. The leather cement, the principal ingredient of which is gutta percha, is widely used in the manufacture of boots and shoes, as well as in other lines.

A BUSY MONTH FOR THE RUBBER CONTROL COMMITTEE.

MEMBERSHIP on the Rubber Control Committee of the Rubber Club of America is no sinecure. The dependence of the continued operation of American mills on the free shipment of rubber from London and the necessity, in order to maintain these shipments, of having the guarantees required by the British Government carried out in good faith, have made the labors of this committee constant and arduous. Six meetings of the committee were held during March and the various questions arising from the present situation were considered and disposed of. The great amount of work involved in getting the necessary rubber supplies for American mills has necessitated a substantial increase in the Rubber Club's office facilities and staff. The secretary's official force now comprises a considerable number of assistants, and in view of the rapidity with which this organization has been brought together, its work is remarkably efficient.

Here is a brief summary of some of the more important matters that were taken up and passed upon by the committee during March:

It was decided that the case marks appearing on rubber guarantees that were filed with the Control Committee must in all cases correspond with the marks on the bills of lading; that in transactions between dealers the marks on the different guarantees should be uniform throughout, and that the only guarantees which would be accepted by the committee would be the official printed forms as prepared by the British Foreign Office.

In view of the extra cost of handling the work of the certification of the guarantees, and the various details connected therewith, it was decided to make the price for certification 6 cents per case instead of 2 cents per case as announced February 13.

An official form has been prepared, for the use of manufacturers, for filing with the British Consul General particulars of shipments to non-European neutral countries.

The Rubber Club, through the Rubber Control Committee, has been in correspondence with the Rubber Exports Committee, of London, in reference to the granting of permits for shipment of rubber to the United States, and other matters affecting the rubber trade of the United States over which the Rubber Exports Committee has jurisdiction.

Arrangements have been made whereby forwarding agents with London connections can take charge of the forwarding, via London, of goods for shipment to neutral European countries, and secure in London the proper licenses for transshipment.

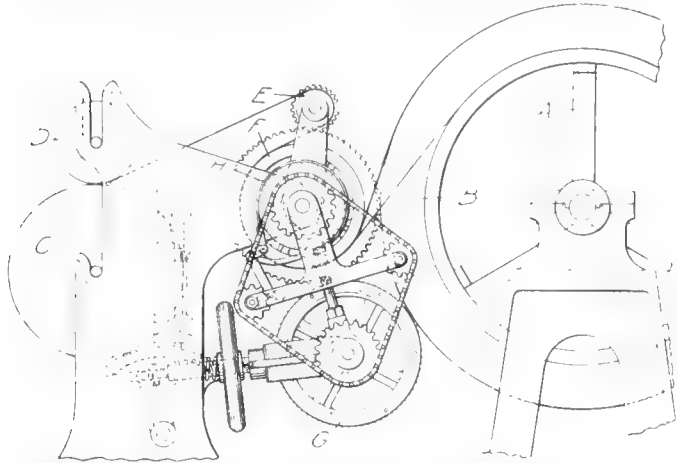
The committee is keeping close watch for possible exports of crude rubber in violation of the guarantees, and is exercising every care to have these guarantees lived up to, in letter as well as in spirit. And it may be added that as far as can be learned, manufacturers and importers are heartily co-operating in this matter.

Sir Richard Crawford, special commissioner attached to the British Embassy at Washington, met with the Rubber Control Committee on March 23, and expressed his appreciation of the efforts of the Rubber Club of America in meeting the situation, and congratulated the club on its efficient work in carrying out the provisions of the guarantees.

New Machines and Appliances.

TIRE FABRIC FEEDING DEVICE.

IN the operation of Gammeter's device, the fabric strip is led from the roller over the tension rollers and applied to the tire core. This is driven by the usual mechanism and serves to propel the measuring wheel through frictional contact. The fabric feeds to the core as fast as the tension roller will allow it, and since the roller is of smaller diameter than the wheel and rotates with it, the fabric is correspondingly stretched over the middle or larger diameter of the core. The resistance to rotation of the main tension roller is furnished in large part by



A—Chuck. B—Core. C—Frictioned Fabric Roller. D—Liner Roller. E—Auxiliary Tension Roller. F—Main Tension Roller. G—Measuring Wheel. H—Brake.

a brake. The pull exerted by the main tension roller will produce a continuous leftward pressure in the frame, causing the brake to contract upon its drum. [United States patent No. 1,124,412.]

AIR BRAKE HOSE MANDREL.

SILLS invention provides a mandrel upon which the hose is formed and vulcanized with enlarged and square finished ends.

The body of the iron or steel mandrel is hollow and slightly enlarged at one end. A collar is fitted over the enlarged end and is held in position by a pin.

At its opposite end the mandrel has a plug with a projecting stem threaded on the outer end. A sleeve that fits over the stem abuts against the end of the mandrel. The outer end of the sleeve is threaded to engage the threaded portion of the plug. The main body portion of the sleeve corresponds



A—Mandrel Tube. B—Collar. C—Collar Pin. D—Threaded Plug. E—Sleeve. F—Sleeve End. G—Hose.

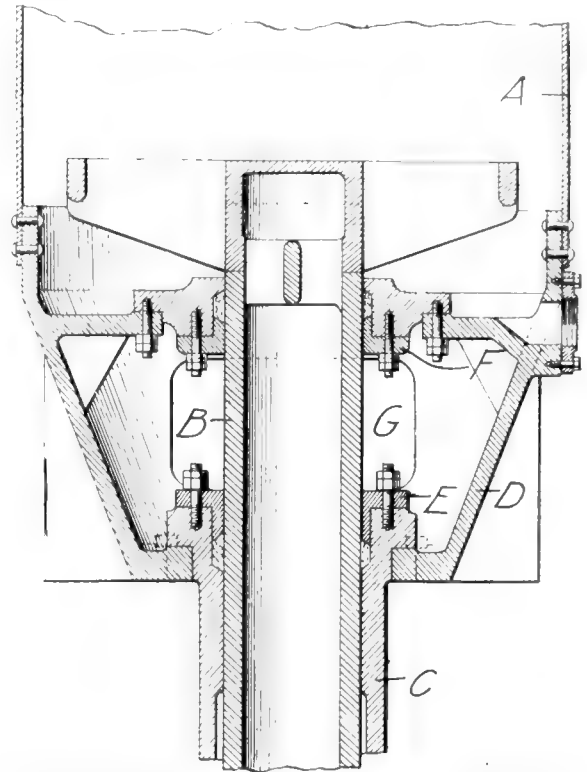
in diameter to the enlarged portion at the opposite end of the mandrel, and these parts form the enlarged ends of the hose section.

The sleeve at its outer end is of the same diameter as the collar at the opposite end of the mandrel. These parts form square shoulders against which the end faces of the hose section are formed. The sides of the collars are flattened to fit the wrench or tool used for unscrewing the sleeve and collar and for replacing them in position. [United States patent No. 1,130,030.]

VULCANIZER PRESS.

THE Adams press has two bearings for the ram and outside openings through which adjustments can be made.

The vulcanizer base is an outwardly flaring casting terminating in a flange to which the vulcanizer shell is riveted. The lower contracted end is formed into a horizontal flange bored to receive the ram cylinder. The upper end of the cylinder is flanged and supports the lower packing gland. Formed integral with the vulcanizer base is a horizontal partition to which is bolted a ring bored to fit the ram at the under side



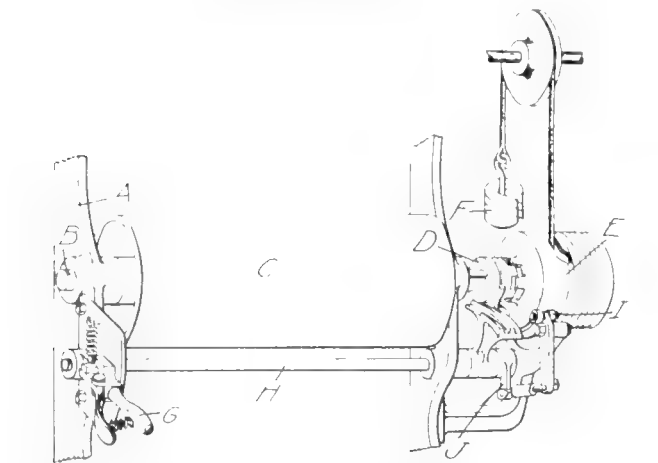
A—Vulcanizer Base. B—Lower Gland. C—Ram Cylinder. D—Ram. E—Upper Gland. F—Ring. G—Holes.

of this ring is bolted the upper packing gland. The flaring wall of the base is provided on opposite sides with openings through which access may be had to the nuts of the bolts fastening the packing glands as well as those of the ring. [United States patent No. 1,128,831.]

NALL'S TENSIONING DEVICE.

THIS device is applied to the type of tire building machines that carries the rolls of frictioned fabric on a revolving frame and delivers the fabric strip to a revolving core. The fabric and liner roller and two guide rollers are not shown. The fabric strip is carried from the stock roller around a guide roller and then around the rubber covered tension roller. It is then passed around another guide roller and the end applied to the tire core, which is revolved by the usual means. Previous to this, however, the operator shifts the clutch lever to its upper position, which moves the segment lever and throws in the jaw clutch. The core is then revolved and the fabric passes around and revolves the tension roller.

This turns the grooved drum and the cord is wound around it, raising the counterweight, which places a tension on the fabric that is even and continuous throughout the operation. As soon as a strip of fabric has been wound on the core, the



A—Rolling Frame, B—Hand Lever, C—Counterweight, D—Grooved Drum, E—Clutch, F—Clutch Operating Shaft, G—Clutch Lever, H—Clutch Operating Shaft, I—Brake, J—Brake Arm

operator moves the lever downward, thereby throwing out the clutch and applying the brake to the drum. [United States patent No. 1,127,494.]

VULCANIZING APPARATUS.

THE Warner apparatus for vulcanizing footwear is operated as follows: The vulcanizer is heated preparatory to the introduction of the footwear. The goods are placed in the heater and the door is closed. The air is exhausted by the vacuum pump and the low pressure and the heat remove air and other gases from the rubber. This serves to compress the footwear on the lasts. The vacuum pump is then stopped, the vacuum broken and communication established with the preheater, which causes the pressure pump to become active by release of pressure in the temperature regulator. The action of the pump



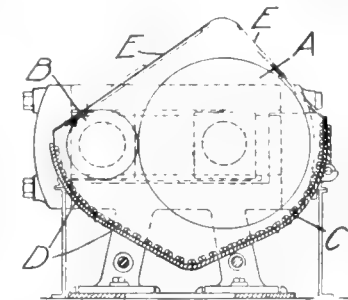
A—Vulcanizing Chamber, B—Temperature Regulator, C—Pressure Pump

continues until the predetermined pressure is reached in the vulcanizer, after which the pump acts either slowly or rapidly to maintain a constant pressure throughout the run. At the time the vulcanizer is placed in connection with the preheater the steam employed as the heating agent for the vulcanizing medium is exerting its influence on the same within the coil of the preheater. The pressure pump fills the chamber and gradually raises the temperature to the limit set upon the capacity of the preheater by the adjustment of the regulator scale beam. When the temperature reaches this limit it is maintained until the completion of the process. [United States patent No. 1,125,609.]

SOLVENT RECOVERY APPARATUS.

THE illustration shows Boecler's solvent recovery apparatus applied to a slitting machine used for making "I I" packing.

The two horizontal rolls are enclosed in a casing and practically divide it in two compartments. The inclined sides of the lower compartment are provided with pipes through which cold water circulates. There is also an opening for discharging the condensed solvent. Hand holes on the front and back communicate with the interior of the casing. [British patent No. 22,638.]

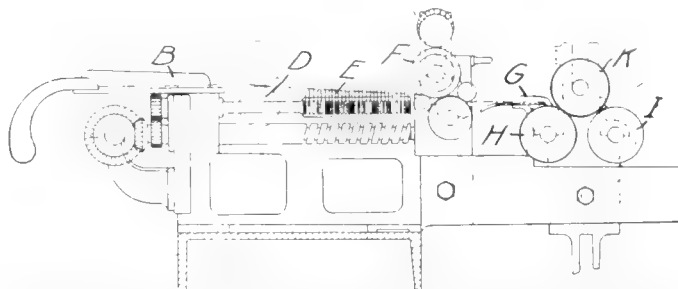


A—Large Roll, B—Small Roll, C—Water Pipes, D—Hand Holes

IMPREGNATING AND SHEETING FIBERS.

COTTON or other fibers are impregnated with rubber and formed in a sheet by Dew's machine.

Thick layers of fiber are fed from a trough, between the feed



B—Feed Trough, C—Feed Rollers, D—Comb Device, E—Presser Rollers, F—Solution Rollers, G—Sheet, H—Presser Roller

rollers and over a comb device by which the fibers are laid parallel to one another. They are then passed between presser rollers, through a guide and between the solution rollers. These rollers dip in a solution of rubber and the presser roller removes the surplus. (British patent No. 11,731.)

NEW STYLE SLITTING AND COILING MACHINE.

CAMERON'S latest machine is designed to handle all sorts of problems in slitting and coiling various kinds of materials, such as sheet rubber, rubber-coated fabrics, paper and other materials used in the form of a narrow strip.

It is equipped to measure the yardage accurately, as a check on waste or loss, and will cut the material in the width of strip required in any size of coil. It produces firm rolls with even edges and of uniform tension, without requiring the goods to be manually stretched.

The Cameron principle consists in the use of a "deaving" or "scoring wheel," which presses through the material rather than cuts through it. This scoring wheel is a circular disc having a V-shaped edge, blunt and mounted on a ball-bearing center, and pressed with a spring pressure against a steel cylinder of intense hardness having a highly polished smooth surface. The severed strips have a perfectly clean edge and will not only remain free from raveling on the edge but in the unwinding of the coils there is no tendency for the threads to become entangled and unravel at the edges. This fact is of prime importance in cable winding strip of all kinds and in insulating strip sold to the trade.

The rewinding apparatus which rolls up the goods following the slitting is known as the "Surface Rewind." It consists of two supporting rolls, of which the cutter roll is one and the riding roll, which presses upon the upper surface of the coils and holds them in uniform contact with the supporting rolls, is

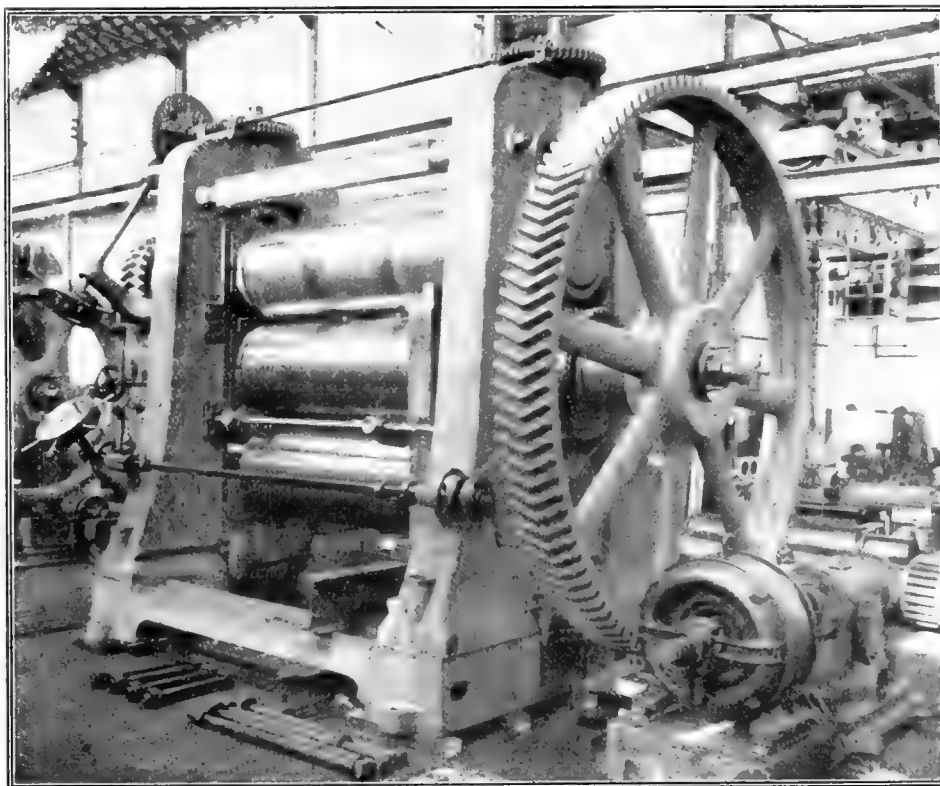


the other. This roll revolves at a higher rate of speed and insures the close winding up of the rolls, thereby producing firm, compact coils without stretching the web. [Cameron Machine Co., Brooklyn, New York.]

LARGE CALENDERS BEING MADE IN ENGLAND.

THE February number of this journal described and illustrated a large three-roll calender being made in an American foundry. David Bridge & Co., Limited, of Manchester, England, are also making some calenders of unusual size. The accompanying cut shows a photograph of a three-roll calender now being constructed in their works. This machine has rolls 28 inches in diameter by 84 inches wide, and two sets of gearing for the following speeds: All three rolls even; top roll friction, two bottom rolls even; bottom roll friction, two top rolls even; and friction both top and bottom.

The changing over from one speed to another is done by double claw clutches, and this can be effected in a few minutes. An improved adjustment enables one or both sides of the top and bottom rolls to be adjusted simultaneously or independently. The motor shown in the photograph was arranged for temporary purposes and does not represent the motor by which the calender will be driven.



LARGE 3-ROLL CALENDER BEING CONSTRUCTED BY DAVID BRIDGE & CO.

OTHER DEVICES.

LATEX COAGULATING MACHINE.—The latex is fed from a tank to an endless belt. This is guided by a series of rollers and passes from the bottom to the top of a chamber through which smoke is drawn by a fan. It then passes in a similar manner through a steam-heated drying room in which hot air is circulated. Stripping rollers remove the surplus latex from the belt. After passing through the drying room the coagulated and dried rubber is removed from the belt. [British patent No. 16,372.]

JAR RING LATHE.—The novel features of this device are the three mandrels. A cutter bar in which are fastened three knives is supported over the mandrels, by a back shaft pivoted in the end frames. This bar is raised and lowered by cam levers which bring the knives in contact with the rubber-covered revolving mandrels. The thickness of the jar rings is regulated by the feed of a head screw that controls the longitudinal movement of the cutter bar. [German patent G. M. No. 619,093.]

TUBULAR FABRIC LOOM.—Chernak's invention relates to the type of loom having a series of shuttles propelled in a circular path and slides reciprocated by cam grooves. The number of warp threads can be materially increased without increasing the diameter of the machine, and the shed forming portions of the warp are given the proper tension. Fastened to the base of the machine is a hollow spindle through which a cable or other core to be covered is fed. In the manufacture of tubular fabric without a core the upper end of the spindle supports a mandrel about which the fabric is woven.

The cam ring is mounted on the hollow spindle and is driven by bevel gears. On the outer surface of the ring are cam grooves which reciprocate the shuttle-propelling slides. These reciprocate vertically the harness slides that carry the warp threads. The slides are thin elongated plates, having longitudinal openings in which wire heddles with warp thread eyes are located. The lower ends of the heddles are secured to fixed pins and their upper ends to vertically adjustable pins carried by slides which are also adjustable by screw threaded stems and nuts to maintain tension on the heddles. The harness slides are

reciprocated and moved simultaneously in opposite directions by the cam grooves, and the warp threads are caused to form sheds through which the shuttles pass. Each harness slide may be provided with any desired number of heddles, and this permits the use of a much larger number of warp threads in proportion to the diameter of the machine frame than would be possible if the warp threads were carried by the shuttle operating slides. [United States patent No. 1,129,642.]

The Annual Report of the United States Rubber Co.

THE annual report of President Samuel P. Colt, of the United States Rubber Co., was mailed to the stockholders of that company on March 6. It is impossible to make a satisfactory comparison of the conditions indicated in this report with those of a year ago, as that report covered only nine months, from April 1 to December 31, 1913, whereas this covers the entire calendar year of 1914. The report, however, contains a number of interesting features. For instance, the stockholders of the company, who in March, 1905, numbered 3,369, increased over 100 per cent. during the next five years, reaching a total in 1910 of nearly 7,000; and that number has also increased over 100 per cent. during the last five years, the present number of stockholders being 14,617.

Another interesting paragraph refers to the increase in the value of plants during the year, which amounts to nearly \$5,000,000, over \$2,000,000 of this having been added to the company's plantation properties in Sumatra.

Two new departures occurred during the year, namely, the formation of an export company, to bring under one control all the export activities of the various subsidiary companies, and the further organization of the Development Department, which is evidently an efficiency movement on a large scale, promoted to see that every part of the company's great organization is kept constantly at its best.

The major part of President Colt's report is given below:

To the Stockholders of the United States Rubber Co.:

This report to the stockholders for the year 1914 covers the first full year since the fiscal year of the company was changed to correspond with the calendar year.

The treasurer's report, appended hereto, gives the consolidated general balance sheet of the United States Rubber Co. and all its subsidiary companies as of December 31, 1914, and the consolidated income statement of the United States Rubber Co. and all its subsidiary companies for the year ending December 31, 1914.

Last year for the first time the consolidated statement included all of the subsidiaries of the company. This year the assets and liabilities of the branch stores of the company are so treated in the consolidated statement, although in many cases the branches are incorporated. This, taken in connection with the profit-sharing stock disposed of, accounts for the decrease of about \$3,000,000 in the item of securities owned by the company.

The number of stockholders of the company shows the following increases:

- In March, 1905, the total number was 3,369
- In March, 1910, the total number was 6,738
- In March, 1915, the total number was 14,617

FINANCIAL POSITION OF THE COMPANY.

The company's policy has been to keep strong in cash, the item of about \$10,000,000 cash on hand representing over 50 per cent. of the company's current liabilities outside of such as would of necessity exist in the transaction of its business.

PLANTS AND PROPERTIES.

The increase over last year of about \$4,850,000 in plants and properties includes an expenditure during the year of about \$2,100,000 on the company's rubber plantations in Sumatra, about \$870,000 on enlargements of Morgan & Wright tire plant at Detroit, about \$355,000 additions to tire and other mechanical plants, about \$360,000 additions to footwear plants, about \$170,000 additions to reclaiming plants, about \$100,000 purchase of real estate for general laboratories, fifty eighth street and Lexington Avenue, New York, about \$208,000 additions to Canadian property, and about \$650,000 resulting from consolidation of branch stores.

VOLUME OF BUSINESS.

The net sales of the company for the year were \$83,678,812.05, which is a reduction of about \$10,000,000 from the sales of the previous twelve months. This has been occasioned by the prevailing lower selling prices of manufactured goods—the volume of merchandise sold having been somewhat greater than in the previous twelve months. The depression of business undoubtedly has curtailed the sales of tires and mechanical goods.

PROFITS.

The net profits, before deducting interest charges, amounted to \$9,776,873.29; after deducting interest charges, the profits were \$7,868,223.54. Dividends to the minority stockholders in certain of our subsidiaries amounted to \$200,884.75. Dividends for the year upon the preferred stock and common stock of the company amounted to \$6,945,388, leaving a surplus of profits of \$721,950.79, which is equivalent to about 2 per cent. upon the common stock additional to the 6 per cent. paid.

DEPRECIATION.

While the company has followed its usual custom of making no one specific charge for depreciation, the fixed properties of the company have been maintained in the highest state of efficiency, the cost thereof being charged to expense account. Inventories of manufactured goods and materials have been brought down to correspond with the lower prices prevailing. An estimate of the amount involved in such reductions is not less than \$1,500,000.

UNITED STATES RUBBER EXPORT CO., LIMITED.

In the latter part of 1913, an investigation was made of the export business of our various subsidiary companies, and of export conditions and possibilities in general, for the purpose of more systematically and efficiently pushing this department of the business. After studying the matter in this country, two representatives visited many of the principal countries abroad, and as a result of reports of this investigation, the United States Rubber Export Co., Limited, was organized and commenced business on December 15, 1914.

THE DEVELOPMENT DEPARTMENT.

During the past year important progress has been made through the development department in collecting, disseminating and applying the vast store of rubber knowledge and experience possessed by the United States Rubber Co. New processes and products of value have been developed and many of the mills have been equipped with the most up-to-date machinery for the use of patented methods and apparatus. Earnest co-operation and initiative on the part of the operating forces have hastened this constructive work, some of which has required years to perfect. As competitive conditions increase, maximum thoroughness becomes a greater need. Much of the effort of the development department has been directed toward increasing the flexibility and resourcefulness of our organization, a matter of vital importance during such critical and changing periods as those now confronting us.

EFFECT OF WAR UPON OUR BUSINESS.

During the early stages of the war, its effect on the footwear business was not what might have been expected, rubber footwear not having been any part of the army or navy equipment for most of the nations at war. In December, however, this situation changed, and the necessity became so apparent that rush orders were sent over here and rubber boots, warm-lined rubbers and wool boots to the extent of one and one-half million dollars in value were shipped to England and to France.

Our sales in mechanical and miscellaneous goods usually reflect general industrial and railroad conditions, and consequently during the first part of this year this department showed a decrease in volume of sales as compared with the same period of the previous year. This condition having become intensified by

the European war, our volume of sales in mechanical and miscellaneous lines was still more adversely affected in the last five months of the year.

The tire business, being still in a period of abnormal growth, is less affected by current business conditions, but undoubtedly the advent of a war depression curtailed tire consumption, so that the last five months of the year did not compare as favorably as the first seven months with the corresponding period of 1913. Our tire business for the year, however, shows an increase in number of tires sold, although the value was less than for the previous year on account of reduction in selling prices.

OUR RUBBER PLANTATIONS IN SUMATRA

Despite the unsettled conditions that have existed throughout the world since August 1, 1914, the affairs of our plantation companies have progressed in an entirely satisfactory way. Due to the efficiency of the Dutch planting organizations and the able co-operation of the Eastern staff of the General Rubber Co., the programme for the year has been substantially carried out without interruption.

The company at the present time has properties in Sumatra aggregating 90,072 acres, of which 42,725 acres are planted, which constitutes the largest group of rubber estates in the world. During the past year the first shipments of rubber from the company's plantations were received, and from this time on the production of the estates should rapidly increase.

THE OUTLOOK

While at the moment there is nothing discouraging in relation to our business, your president feels that the year 1915 is one of uncertainty; and it may be considered good fortune if we are able to maintain or to increase our volume of sales and profits as compared with last year. When the uncertainties caused by the war shall have ceased, when we shall receive a substantial part of our crude rubber from our Sumatra plantations, and when we shall have realized our anticipations from our development and operating departments, we fully expect to enjoy prosperity greater than we have heretofore known.

TREASURER'S REPORT.

UNITED STATES RUBBER CO. AND SUBSIDIARY COMPANIES. ASSETS

Property, plants and investments, including stock in subsidiaries	\$123,726,173.66
Inventories, manufactured goods and materials	\$33,606,740.57
Cash	10,767,614
Notes and loans receivable	733,750.86
Accounts receivable	19,107,174.43
Securities, including stock of United States Rubber Co. held by subsidiary companies	3,346,033.88
Sinking fund cash in hands of trustees	446,708.30
Miscellaneous	138,576.11
Total assets	\$194,926,419.66

LIABILITIES

Capital stock, first preferred	\$8,644,600.00
Capital stock, second preferred	58,400.00
Capital stock, common	86,000,000.00
Capital stock, rubber goods Manufacturing Co.	
Preferred issued	\$10,351,400.00
Owned by United States Rubber Co. deposited with trustees	8,876,500.00
Common issued	8,441,700.00
Owned by United States Rubber Co. deposited with trustee	10,881,700.00
Subsidiary of Rubber Goods Manufacturing Co.	37,500.00
Minority Canadian Consolidated Rubber Co., Limited, stock, preferred \$282,380; common \$206,835	489,215.00
Ten-year 6 per cent. Collateral Trust Sinking Fund gold bonds, United States Rubber Co.	17,000,000.00
Ten-year 4 1/2 per cent. Debentures, General Rubber Co.	\$9,000,000.00
Ten-year 5 per cent. Debentures, Eureka Fire Hose Manufacturing Co.	170,000.00
Forty-year 6 per cent. Collateral Trust gold bonds, Canadian Consolidated Rubber Co., Limited	\$2,600,000.00
Less owned by subsidiary company	203,000.00
Mechanical Rubber Co. and New York Belting & Packing Co., bonds	\$52,500.00
Notes and loans payable	17,910,103.83

Accepted by United States Rubber Co.	\$8,644,600.00
McGowan & Co., 100% payable	77,608.50
Accepted by United States Rubber Co.	3,346,033.88
Reserve for contingencies	1,000,000.00
Insurance fund	1,000,000.00
Employer's liability fund	1,000,000.00
Reserve for contingencies	1,000,000.00
United States Rubber Co. (General)	1,000,000.00
Surplus	6,000,000.00

Total \$194,926,419.66

(For the surplus \$14,000,000.00 transferred out of stock account)

CONSOLIDATED INCOME STATEMENT FOR THE YEAR ENDING DECEMBER 31, 1914

Net sales, including interest on bonds and miscellaneous	\$8,600,000.00
Less:	
Cost of materials, including freight and express	1,000,000.00
Operating expenses	1,000,000.00
Less:	
Cash discount allowed	1,000,000.00
Interest on bonds	1,000,000.00
Depreciation	1,000,000.00
Federal income tax 1914	1,000,000.00
Income charges	1,000,000.00

Net income prior to interest charges \$9,776,871.19

Interest on bonds and floating debt 1,000,000.00

Net profits \$8,776,871.19

Dividends, United States Rubber Co. \$1,000,000.00

Dividends, Canadian Consolidated Rubber Goods Manufacturing Co. and subsidiary company and Canadian Consolidated Rubber Co., Limited, and subsidiary company 1,000,000.00

Surplus for period \$7,776,871.19

Surplus, beginning of period \$19,107,174.43

Additions to surplus, capital gain on conversion of second preferred into first preferred stock 1,000,000.00

Adjustment, transferable to first preferred stock 1,000,000.00

Surplus, December 31, 1914 \$20,107,174.43

Respectfully Submitted, W. G. PARSONS, Treasurer

ANNUAL ELECTION.

BOARD OF DIRECTORS FOR 1915

The following Board of Directors was elected at the annual meeting of the United States Rubber Co., March 16, all having served before with the exception of Mr. Middleton S. Burrill, who takes the place of Mr. D. Lorne McGilbon.

1. Walter S. Ballou, Providence, R. I.
2. James C. Brady, New York City.
3. Nicholas F. Brady, New York City.
4. Middleton S. Burrill, New York City.
5. Samuel P. Colt, Providence, R. I.
6. Harry E. Converse, Boston, Mass.
7. James Deshler, New Brunswick, N. J.
8. James B. Ford, New York City.
9. Francis L. Hine, New York City.
10. Henry L. Hotchkiss, New Haven, Conn.
11. Arthur L. Kelley, Providence, R. I.
12. Lester Leland, Boston, Mass.
13. Samuel M. Nicholson, Providence, R. I.
14. Raymond B. Price, New York City.
15. Homer E. Sawyer, New York City.
16. William H. Truesdale, Greenwich, Conn.
17. Theodore N. Vail, Boston, Mass.
18. John D. Vermeule, New York City.
19. Elisha S. Williams, New York City.

OFFICERS

At a meeting of the Board of Directors of the United States Rubber Co., held March 18 at the office of the company, 1790 Broadway, New York, all the officers were re-elected for the ensuing year. They are as follows:

Samuel P. Colt, president.
James B. Ford, vice-president.
Lester Leland, vice-president.
Raymond B. Price, vice-president (Development Department).
Homer E. Sawyer, vice-president (Footwear Department).
Elisha S. Williams, vice-president (Tire and Mechanical Department).
Samuel Norris, secretary.
W. G. Parsons, treasurer.
E. J. Hathorne, assistant treasurer.
John D. Carberry, assistant secretary.

EXECUTIVE COMMITTEE.

Walter S. Ballou, Nicholas F. Brady, Samuel P. Colt, James B. Ford and Lester Leland.

THE B. F. GOODRICH CO.'S ANNUAL REPORT.

At the meeting of the stockholders of The B. F. Goodrich Co., held in New York, March 10, the president submitted his report for the year ending December 31, 1914, from which the following paragraphs are taken:

"After making liberal provision for all maintenance charges, depreciation, bad debts, and all outstanding liabilities, etc., the net income for the period, as shown by the profit and loss account appended, was \$5,440,427.00 compared with \$2,599,747.39 in 1913.

"Your directors have voted, subject to the approval of the shareholders, to retire 20,000 shares of the preferred stock. This is in accordance with the provision of your company's charter, which provides for the retirement of a minimum of 9,000 shares of the preferred stock each year, beginning with July, 1914. At the annual meeting the shareholders will be asked to approve the retirement of this stock."

The treasurer's report, as contained in the consolidated balance sheet and profit and loss and surplus accounts, given in full below, shows the financial condition of the company:

CONSOLIDATED BALANCE SHEET.
ASSETS.

Capital assets:	
Real estate, buildings, plant, machinery, and sundry equipment less reserve for depreciation.....	\$12,391,515.97
Patents.....	58,000.73
Goodwill.....	57,798,000.00
	\$70,772,417.70
Investments in other companies, to wit:—	1,207,058.00
Shares of the B. F. Goodrich Co. representing the net investment at December 31, 1914.....	1,216,255.98
17,441 Shares of 7 per cent. cumulative preferred stock of the B. F. Goodrich Co. at par.....	1,744,000.00
Current assets:	
Inventory of raw materials, partly manufactured and finished stock.....	\$11,308,857.30
Trade accounts receivable, after deducting reserve for doubtful accounts, discounts and allowances.....	3,101,620.92
Other accounts receivable.....	1,445,612.56
Bills receivable.....	262,945.10
Cash in banks.....	4,193,521.25
	20,311,557.13
Deferred charges on future operations.....	185,464.87
Prepaid insurance, interest, taxes, etc.....	894,936.63

DECEMBER 31, 1914. LIABILITIES.

Capital stock:	
60,000 Shares of common stock of the B. F. Goodrich Co. at par.....	\$60,000.00
200,000 Shares of 7 per cent. cumulative preferred stock at the par value of \$100 each, \$20,000,000.00.....	20,000,000.00
Deduct:	
17,441 Shares of preferred stock, retired and retired in full.....	900,000.00
	29,100,000.00
	\$80,900,000.00
Current liabilities:	
Accounts payable.....	\$418,737.72
Notes payable.....	513,329.93
	1,459,041.11
Notes payable.....	300,000.00
Accounts payable.....	900,000.00
Notes payable.....	3,177,909.63
	\$94,936.63

SURPLUS ACCOUNT.

Balance forward.....	\$2,599,747.39
Net profit for the year ending December 31, 1914, per annum.....	5,440,427.00
	\$8,040,174.39
Less:	
Dividends paid.....	8,000,000.00
Retirement of preferred stock.....	2,068,500.00
	2,968,500.00
Balance forward.....	\$5,071,674.39

PROFIT AND LOSS ACCOUNT.

FOR THE YEAR ENDING DECEMBER 31, 1914.

Net sales.....	\$41,764,008.66
Deduct: Manufacturing, selling and general administration expenses.....	36,189,641.67
Profit from Operations.....	\$5,574,366.99
Add—Miscellaneous income.....	562,930.10
	\$6,137,297.09
Deduct:	
Provision for depreciation.....	\$573,816.11
Interest on bills payable, etc.....	123,253.98
	696,870.09
Net profit earned to surplus account.....	\$5,440,427.00

THE B. F. GOODRICH CO. ELECTS OFFICERS.

At the regular annual meeting of The B. F. Goodrich Co., held in New York, March 10, a resolution reducing the number of directors from 16 to 14 was approved. O. C. Barber and Phillip Lehman retired from the board, and four other directors—Henry Goldman, A. H. Marks, A. H. Wiggin and B. G. Work—whose terms had expired, were re-elected for three years.

A special meeting of stockholders was held on the same day, at which resolutions were adopted for a reduction of preferred stock from \$30,000,000 to \$28,000,000.

The directors elected the following officers for a period of one year: President, B. G. Work; vice-president and general manager, A. H. Marks; second vice-president and sales manager, H. E. Raymond; second vice-president and works manager, E. C. Shaw; secretary and assistant treasurer, C. B. Raymond; treasurer, W. A. Means; assistant secretary and assistant treasurer, Guy E. Norwood; assistant sales manager, W. O. Rutherford; auditor, William Murray.

THE WAR'S INFLUENCE ON AUTOMOBILE EXPORTS.

Government statistics show that in 1914 3,430 trucks, valued at \$8,985,756, and 22,335 pleasure vehicles, valued at \$19,521,708, were exported, against 1,000 trucks, valued at \$1,686,807, and 25,880 pleasure cars, valued at \$25,343,644, in 1913. The influence of the war will be noticed in the increased proportion of trucks and decreased number of pleasure cars included in the 1914 figures. December shipments go a long way towards causing these differences.

In December last 1,279 motor trucks were exported, against 88 in the same month of 1913—an increase of 1,191; the values in the respective years being \$3,387,729 and \$100,660—an increase of \$3,287,129. There were 1,297 pleasure cars exported in December, 1914, against 2,301 in the same month of 1913—a decrease of 1,004 cars, and a decrease in value from \$2,052,484 to \$988,698, or \$1,053,786.

In statistics for the month of December exports to France show the greatest increase—from a total of 120 cars, valued at \$100,418, in 1913, to 969 cars, valued at \$2,588,622, in 1914. Exports to the United Kingdom show a comparatively slight gain, from 648 cars, valued at \$484,299, in 1913, to 860, valued at \$1,097,007, in 1914. Italy and Germany were not represented in these December statistics, and exports to all other Europe fell off for the month from 160 cars in 1913 to 27 in 1914.

SOLID TIRE PRICES REDUCED.

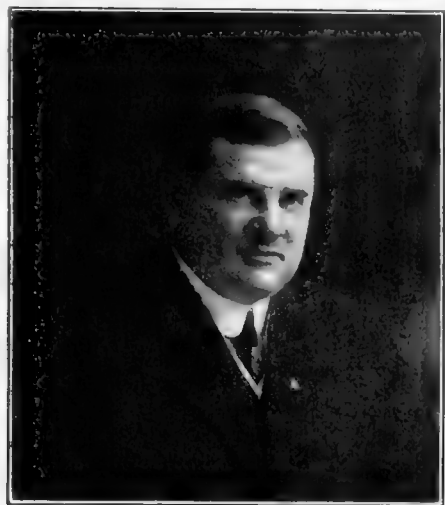
The Firestone Tire & Rubber Co., of Akron, Ohio, on March 8 issued a new list of prices on solid truck tires. This list, which is net, quotes prices from 10 to 15 per cent. lower than any previously quoted on these tires.

A reduction of 20 per cent. has been made in the price of the Motz cushion tire, the manufacture and sale of which has been taken over by the Goodyear Tire & Rubber Co., of Akron, as mentioned on page 283 of our February issue; this reduction taking effect March 20.

BANQUET OF WASTE MATERIAL DEALERS

THE second annual banquet of the National Association of Waste Material Dealers took place at the Hotel Astor, New York, on the evening of Tuesday, March 16. The occasion was remarkably successful for an organization which had just reached its second milestone. The association, which numbered approximately 40 members at the conclusion of its first year and on the occasion of its last banquet, showed a strength of 101 members at the dinner held on the 16th ultimo.

The banquet committee, in addition to providing an excellent repast, furnished a highly interesting cabaret, including a mono-



LOUIS BIRKENSTEIN.

logist, a number of fair dancers, and a singer of pronounced vocal attainments.

The toastmaster was Mr. Theodore Hofeller, first president of the association, who spoke in semi-humorous vein, and whose introductions were unusually happy. Among the speakers introduced by Mr. Hofeller were: Mr. W. T. Rodenbach, well known in reclaiming circles and the founder of the Reclaimers' Club; Mr. Evan G. Badger, president of the Philadelphia Paper Stock Dealers' Association; Mr. Frank C. Overton, acting president of the associated dealers in paper mill supplies in New York, and Mr. John J. Holland, secretary of the Paper Mill Supply Dealers' Association of New England. All of these gentlemen spoke in an interesting manner, all speeches being free from "waste material."

The only condition detracting from the enjoyment of the dinner was the absence of Mr. Louis Birkenstein, the re-elected president of the association and the gentleman through whose effective administration the membership was so appreciably augmented during his first term as president. His annual address was read in his absence by the secretary, Charles M. Haskins.

He first expressed his great regret because, owing to family reasons, he was not able to be present. He next referred to the progress that the club had made during the year, and the co-operation among all its officers in working for its welfare. He then continued:

"Every one in the trade is bound to admit that what we have accomplished is more than even the most sanguine anticipated. Few outside of the waste trade have any conception of the vastness of our industry and the difficulties under which we have been called upon to labor. We should educate the public as well as the trade to appreciate that our transactions are as legitimate and our members as substantial and reliable as can be found in any other line of business. Our principal purpose, therefore, is to impress upon our members to so conduct their

business that no reproach can be made against their methods, integrity or honesty.

"Further than this, the different divisions have, after long deliberation, adopted specifications and rules which are considered fair by both buyers and sellers in and out of our association, and should make trading in these commodities more satisfactory. Our recommendation to the trade to arbitrate controversies has been taken advantage of more frequently than the members at large are aware, and in all cases has restored good feeling and made fair and equitable adjustments."

He spoke of the steps that had been taken to make arrangements of reciprocal benefit with the Berlin Metal Exchange, which arrangements of course were temporarily in abeyance because of the war. He stated that the association's Boston office had proved of great advantage, and believed that when a larger membership justified the increased expense it would be an excellent idea to have a second office in New York, where members could meet socially or for business purposes.

Several letters of regret were read from invited guests who were unable to be present, among them being a communication from ex-Governor Guild of Boston, and one from Mr. Frank H. Appleton, of the same city.

The newly elected officers are: Louis Birkenstein, president; Simon Weil, first vice-president; Daniel I. Murphy, second vice-president; Clarence B. White, third vice-president; Edward Stone, fourth vice-president; H. H. Cummings, fifth vice-president; P. Walsh, Jr., sixth vice-president; Charles M. Haskins, secretary; Mark Sherwin, treasurer; Theodore Hofeller, Ross B. Linton, Henry Lissberger, Charles Frankel, Isaac Grodin, Morton B. Smith, John Burke, James Rosenberg, Herman Sonken and Joseph Gatti, directors.

Among the prominent waste rubber dealers present were: D. Feinberg, Boston; S. Bers, Philadelphia; E. Frankel, Toronto; H. Birkenstein and A. Birkenstein, of Chicago; L. Loeser, Eugene Hofeller and Julius Hofeller, of Buffalo; N. E. Berzen, H. H. Cummings and E. A. Cummings, of New York.

THE SOCIETY OF AUTOMOBILE ENGINEERS.

The Society of Automobile Engineers has announced the membership of its Committee of Standards.

A new division of International Standards has been created and the adjustment of tire and rim standards in this and foreign countries will be one of the first undertakings of this new division.

It is to be hoped that an understanding will be reached with a view of reducing the difficulties encountered by American exporters in consequence of the lack of agreement between the sizes of products of this class in different countries.

Several prominent rubber men are members of the various divisions of the S. A. E. Standard Committee: W. H. Allen, of The B. F. Goodrich Co.; Y. E. Hale and E. R. Hall, of the Goodyear Tire & Rubber Co.; John V. Pugh, of Rudge-Whitworth; E. E. Bennett, of the Tire Manufacturers' Association; C. C. Carlton, of the Firestone company; C. B. Whittelsey, of the Hartford Rubber Works Co., and J. H. Wagenhorst, of the United Rim Co.

TIRE COMPANIES INTERESTED IN SPRINGFIELD AUTO SHOW.

An automobile show will be held in the Auditorium, Springfield, Massachusetts, from March 27 to April 3, arrangements for which were made at a banquet late in February of the Automobile Accessory Dealers' Association in that city, attended by representatives of several of the leading tire companies, notably the Fisk, Goodrich and Goodyear. In an address on that occasion on the subject of price maintenance, F. E. Moore of the Goodrich company spoke of the advantage to the consumer of a standard price that enables the honest dealer to stay in business by giving him a fair profit.

News of the American Rubber Trade.

SOME PRODUCTION FIGURES OF BOSTON WOVEN HOSE AND RUBBER CO.

OF the product of the Boston Woven Hose & Rubber Co.—embracing rubber goods of almost every description, with the exception of shoes and clothing—nearly a fourth consists of fruit jar rings. The output of these rings in one day is placed at 10 tons, and the yearly production, if linked together in the form of a chain, would twice encircle the globe. Rubber hose to the amount of 20,000,000 feet, in sizes from $\frac{1}{8}$ inch to 4 feet in diameter—the latter for use on dredges—is produced annually. The average daily output of rubber heels is 6,000 pairs, and of rubber friction and insulating tape between 7 and 8 tons. The factories of the company are located at Cambridge and Plymouth, Massachusetts.

KATZENBACH & BULLOCK CO. OPENS CHICAGO OFFICE.

The Katzenbach & Bullock Co., which imports and deals in chemicals and colors, with offices at 100 William street, New York, and in the Broad Street Bank Building, Trenton, New Jersey, is opening a new office in the Railway Exchange Building, Chicago, in charge of Casper Smith, of New York. This company was incorporated, under the laws of New Jersey, in 1910, by William S. Katzenbach and E. L. Bullock, the business having been founded by the former in 1909, and has become favorably known to the trade throughout the United States and Canada. This Chicago branch will enable the company to care for its western trade even more satisfactorily than in the past.

THE REPUBLIC RUBBER CO. INCREASES ITS CAPITAL STOCK.

The new stock issue of the Republic Rubber Co., of Youngstown, Ohio, mentioned on page 337 of our March issue, has been authorized by stockholders, and new preferred stock, maturing in 1930, to the amount of \$4,000,000 will be issued. Of this new issue \$2,500,000 is to be applied to the retirement of preferred stock now outstanding and matured September 1 last. Shares to the value of \$500,000 will be held in the treasury and issued as required, the proceeds of the remaining \$1,000,000 to be devoted to enlargement of the company's business, principally for extending its sales facilities. Holders of outstanding preferred, up to 98 per cent. of the value of the securities concerned, have waived their right to require purchase of the retired preferred at 105 and are accepting shares of the new issue for their former holdings, share for share.

THE CHANCE TO GET A FINE PAINTING OF GOODYEAR.

In THE INDIA RUBBER WORLD for January, 1913, on page 215, there was a large halftone reproduction of a recently finished oil portrait of Goodyear. This painting shows the head and shoulders of Goodyear, life size, and it is one of the best ever made of the famous inventor. The features are strong in character and excellent in likeness. The artist, Miss Frances Chamberlin, of 739 Boylston street, Boston, is offering this portrait for sale. This is an excellent opportunity for some individual or company to get an exceptionally good portrait of Charles Goodyear.

THE CORN PRODUCTS REFINING CO.

The Corn Products Refining Co., manufacturers of "Paragol," a rubber substitute, of 17 Battery place, New York, held its annual meeting late in March, when F. H. Hall and Preston Davies were elected directors, to succeed F. T. Bedford, resigned, and J. A. Moffett, deceased. A telegram was received at this meeting from E. T. Bedford, president of the company, who stated that he was unable to attend owing to the hearings of the Government dissolution suit at San Francisco.

NEW \$1,000,000 PREFERRED STOCK ISSUE FOR CANADIAN CONSOLIDATED.

At a meeting of stockholders of the Canadian Consolidated Rubber Co., Limited, of Montreal, Quebec, on March 8, a new preferred stock issue of 10,000 shares was authorized—to be allotted to present stockholders at par—and at the same time the directors were authorized to issue 200 shares of preferred stock then being held in the treasury. It is stipulated in the terms under which the new stock is to be issued that the United States Rubber Co., which owns a majority of the present stock outstanding, will take whatever part may not be subscribed for by the other stockholders, in addition to its own pro rata share. The proceeds of the sale of this new \$1,000,000 issue are to be used for working capital, demanded by the increase and growth of the business.

RUBBER COMPANY DIVIDENDS.

The American Chicle Co., of New York, on March 22, declared the usual quarterly dividend of $1\frac{1}{2}$ per cent. on its preferred stock, payable April 1 to stockholders of record on March 24; also the usual monthly dividend of 1 per cent. on common stock, payable April 20 to stockholders of record on April 15.

The Apsley Rubber Co., of Hudson, Massachusetts has declared a semi-annual dividend of 2 per cent. on its common stock and a similar dividend of $3\frac{1}{2}$ per cent. on its preferred stock.

The Boston Belting Co., of Boston, has declared a quarterly dividend of \$2 per share—payable April 1 to stockholders of record on March 22.

The Goodyear Tire & Rubber Co., of Akron, Ohio, paid on March 1 a quarterly dividend of 3 per cent., announcing that in future dividends will be paid quarterly instead of annually as heretofore.

The Kelly-Springfield Tire Co., of Akron, Ohio, has declared a dividend of $1\frac{1}{2}$ per cent. on its first preferred stock, a dividend of $1\frac{3}{4}$ per cent. on second preferred stock—both payable April 1 to stockholders of record on March 15—and a dividend of $1\frac{1}{2}$ per cent. on common stock—payable May 1 to stockholders of record on April 15.

The Republic Rubber Co., of Youngstown, Ohio, paid on March 1 a quarterly dividend of $1\frac{3}{4}$ per cent. on preferred stock.

The Rubber Goods Manufacturing Co., of New Brunswick, New Jersey, paid on March 15 a quarterly dividend of $1\frac{3}{4}$ per cent. on preferred stock and a dividend of 1 per cent. on common stock.

CAPITAL STOCK CHANGES.

The Canadian Consolidated Rubber Co., of Montreal, Quebec, has increased its capital stock from \$2,000,000 to \$3,000,000.

The B. F. Goodrich Co., of New York, has reduced its capital stock from \$90,000,000 to \$88,000,000.

The Toledo Tire & Supply Co., of Toledo, Ohio, has increased its capital stock from \$10,000 to \$25,000.

RUBBER BANDS OUT OF A CLEAR SKY.

In a recent Hodgman catalog there is a very striking illustration having for its main thought a generous distribution of elastic bands. Hovering over the riot of sky scrapers that go to make up the city of New York is a gigantic aeroplane. From it comes a cloudburst of rubber bands, in boxes and in bulk. The air is full of them. The artist's conceit is one that catches the eye and stirs the imagination and suggests a big business in this specialty.

AJAX-GRIEB RUBBER CO. LIVING UP TO AGREEMENTS.

The Ajax-Grieb Rubber Co., of Trenton, New Jersey, which manufactures the Ajax tire, has sent the following notice to its tire dealers, asking their co-operation—by living up to the terms of the agreements under which rubber is now being purchased in continuing the suspension of the British embargo:

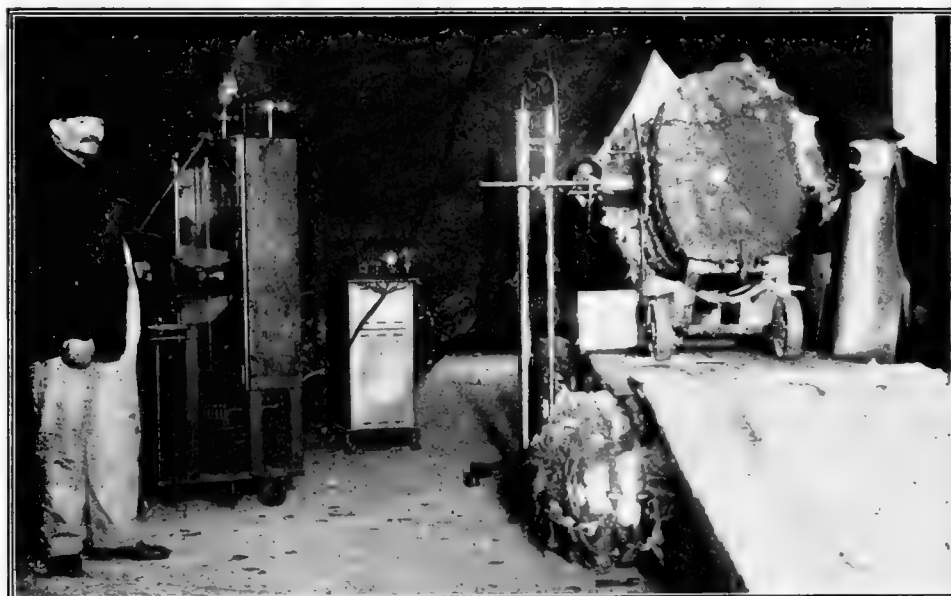
"As manufacturers we are obliged to rely upon the good faith of our customers and their assurances that they will not export any Ajax tires, excepting to Great Britain, a British possession, France or Russia, and only to a European neutral country by way of the United Kingdom, and should any Ajax tires be exported to a non European country you will give to the British Consul in your district the details of such shipments.

"The continuation of rubber shipments from Great Britain depends entirely upon the good faith of the American rubber trade, and we ask your co-operation in this matter."

HOW THEY DETECT RUBBER IN BALES OF COTTON.

The attempt to export rubber secreted in bales of cotton was described on page 314 of the March issue of this publication.

The rubber was in the form of sheets laid very evenly inside of the cotton bales, with a thickness of several inches of cotton outside the rubber. But the X-rays to which export goods are subjected by the British Secret Service showed that there was some foreign substance concealed within the cotton. The illustration here-with shows the method of examining exports by means of the X-ray. In the picture a bale of



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BRITISH SECRET SERVICE MEN X-RAYING BALES OF COTTON.

cotton is being subjected to the rays. The inspector, standing at the right, can detect, when the rays are applied, any unevenness or peculiarity in the package before him. It will be noticed that not only is his face protected, but his whole body is covered with a sheet of rubber and lead, so that the rays going through the package may not have an injurious effect upon the inspector.

THE MISHAWAKA COMPANY TO MAKE A NEW LIGHT RUBBER.

The Mishawaka Woolen Manufacturing Co., of Mishawaka, Indiana, which manufactures the well-known "Ball Band" rubber boots, arctics, wool boots, etc., has started work on a new manufacturing and office addition to its plant. The new building will be 400 x 160 feet in size and will cost in the neighborhood of \$500,000. With the completion of this addition it is expected that the company will increase the operating force from the present 2,000 to about 3,000, producing a new line of light weight rubbers, on which deliveries are to begin next January. The office portion of the new building will be six stories high and will be constructed with a view to "welfare" features and all conveniences for the office staff of 200 persons. The factory portion will be four stories high.

The Elgin road races, promoted by the Chicago Automobile Club, will be held this year August 20 and 21.

TRADE NEWS NOTES.

The Firestone Tire & Rubber Co., of Akron, Ohio, is soon to erect a brick building for its branch at Omaha, Nebraska, of which F. C. Rudisell is manager. This building will be 37 x 140 feet, three stories high, will cost approximately \$35,000 and will be located on Furman street.

The Knight Tire & Rubber Co., of Canton, Ohio, has established a branch at 716 North Broad street, Philadelphia, in charge of Fred Harrington.

A rubber short boot, wool-lined, is the best footwear for the soldier in the present war, where he spends so much of his time in the trenches.

The Faultless Rubber Co., of Ashland, Ohio, is contemplating the addition to its plant of a two-story building 60 x 180 feet, also a two-story wing 50 x 50 feet.

On April 1 the Detroit branch of the Pennsylvania Rubber Co., of Jeannette, Pennsylvania, will remove to new and larger quarters in the Edwin St. George building.

C. Kuentzel, formerly connected with the Goodyear Tire & Rubber Co., of Akron, Ohio, and an inventor of machinery for use in rubber manufacture, has opened an office in Akron, as consulting engineer. He will devote special attention to the improvement and design of machines suitable to all branches of rubber goods manufacture.

The annual meeting of the American Automobile Association, for the year

1915, will be held in Boston, May 18 and 19.

Chewing gum wrapped in labels which describe it as flavored with fruit when it is not actually so flavored will hereafter be regarded as adulterated and misbranded within the meaning of the Food and Drugs Act.

The Society of Automobile Engineers will hold its summer meeting from June 14 to 16, inclusive, in conjunction with an excursion to Georgian Bay, starting from and returning to Detroit, on the steamer "Noranic" of the Northern Navigation Co. line.

Ingram & Son, of London, England, manufacturers of rubber nipples, and said to be the first concern to produce a practical transparent article of this nature, have recently increased their manufacturing facilities by factory additions, so that they are now in a position to fully meet trade demands. Their representative in this country is Ernest Monnier, Boston.

GEORGE E. PELL MOVES TO LARGER OFFICES.

Mr. George E. Pell opened an office about six months ago in the Produce Exchange Annex, New York, as a broker in crude rubber, but he has already outgrown his original quarters, and late in March he moved to more capacious offices in the same building. He is now to be found in rooms 4 and 5, floor L, Produce Exchange Annex.

PERSONAL MENTION.

Ralph W. Ashcroft, manager of the publicity department of the Canadian Consolidated Rubber Co., Limited, of Montreal, whose clever work in bringing the product of his company to the attention of Canadian buyers has been mentioned from time to time in this publication, paid New York a brief visit early in March. Mr. Ashcroft states that the war made such a demand on his company for boots and heavy goods that all the footwear coming under these two heads was cleared out from their storehouses everywhere in Canada. The reclaiming business of the company has also received a great impetus, partly because of the embargo laid upon all rubber scrap in Canada, forbidding its exportation anywhere outside the British Empire.

Marshall D. Wilbur, of Chicago, secretary of the Blodgett Rubber Co., of St. Joseph, Michigan, is said to be negotiating for the purchase of a hydro-aeroplane, for use between the two cities, the saving of time effected by this means being two hours on each trip, which by train takes three hours.

M. E. Baird, secretary and treasurer of the Bi-Lateral Fire Hose Co., of Chicago, made a recent brief visit to Daytona, Florida, stopping off for a day on his way from Beresford to Chicago.

W. E. Anderson has been appointed manager of the Chicago branch of the Dayton Rubber Manufacturing Co., of Dayton, Ohio, with headquarters at 2012 Michigan avenue.

R. K. Sheppard, of The B. F. Goodrich Co., elected president of The Associated Manufacturers of Electrical Supplies, formed on March 9, was presented on that occasion with a handsome silver loving cup by fellow members of the committee on organization, in appreciation of his services in the interest of the association's formation.

Edward T. Smith has been elected president and manager of the Chicago Rubber Co., to fill the office recently vacated by the resignation of L. C. Lawton.

D. M. Colwell has been appointed district manager of the Goodyear Tire & Rubber Co., for the southern district, which includes all the Southern states and has factory branches in Jacksonville, New Orleans, Birmingham, Charlotte, Atlanta, Memphis and Nashville. His headquarters are at Atlanta, Georgia. Mr. Colwell has been with the Goodyear company for the past five years, first working in the factory and becoming familiar with the manufacturing processes, and later, successively, as road representative, sales instructor and assistant manager of the sales department.

Arthur P. Mosby, formerly connected with the Knight Tire & Rubber Co., of Canton, Ohio, at its Baltimore branch, has secured sales rooms at 204 St. Paul street, Baltimore, and taken the sale of Midgley tires in and around that city.

William J. Slater, who has just joined the sales organization of the Firestone Tire & Rubber Co., at Akron, Ohio, was at one time advertising manager for the company, later occupying a similar position, in addition to that of sales manager, with one of the automobile concerns.

W. Howard Barcus, for the past 14 years traveling representative of the "Carriage Monthly," first in the Eastern states and later in Ohio, Indiana and Kentucky, has given up his work with that publication and become branch manager for the Fisk Rubber Co., of Chicopee Falls, Massachusetts. He will have charge of Fisk tire sales in the State of Ohio, with headquarters at Cleveland.

J. A. Moroney has been appointed sales manager of the carriage tire department of the Goodyear Tire & Rubber Co., Akron, to succeed M. E. Morris, transferred to a position as manager of the Pacific Coast district.

Charles E. Arnold, of the firm of Arnold & Zeiss, New

York, who is convalescent from a severe attack of pneumonia, is spending a few weeks in Daytona, Florida.

Nicholas F. Brady, a director in the United States Rubber Co., is a stockholder in the newly formed Peoli Aeroplane Corporation, which has as its object the construction of armored war aeroplanes.

MR. BURRILL NEW UNITED STATES RUBBER CO. DIRECTOR.

At the last annual meeting of the United States Rubber Co., held on March 16, Mr. Middleton S. Burrill was elected a director. Mr. Burrill has not been the subject of as much publicity as usually falls to the lot of leading financiers, but he is known in Wall street as a man of ample resources, wide information and of large and successful operations. He is probably one of the best-informed men on general conditions to be found in the financial district, and his many successes prove him to be a man of exceptionally sound judgment. He cannot fail to add strength to the company's directorate.

SOME RUBBER MEN ON A SOUTHERN TRIP.

A party consisting of the directors and guests of the Atlantic Coast Lumber Corporation, the United Timber Corporation and The Georgetown & Western Railroad Co. left New York, March 18, for a five days' tour of inspection of these properties, which are located in South Carolina. The company included the following well known rubber men connected with the United States Rubber Co.: Colonel Samuel P. Colt, Francis Lynde Stetson, James B. Ford, Nicholas F. Brady, Lester Leland, Walter S. Ballou and Henry L. Hotchkiss—all of whom are directors of the United States company. In addition there were Samuel Norris and John D. Carberry, the company's secretary and assistant secretary. Other members of the party were United States Senator LeBaron B. Colt, of Rhode Island; Herbert L. Satterlee, of J. P. Morgan & Co., Raymond S. Farr, M. J. Quinn, R. J. Clifford and Frank J. Saxe.

ALGOT LANGE TO EXPLORE SOUTH AMERICA AGAIN.

Most men interested in the great rubber country of the Amazon are familiar with the explorations in that part of the world of Algot Lange, as he has written two books on the subject, besides many newspaper articles, and in addition has lectured quite extensively on what he has seen in his various Amazon visits. He expects to return to the lower Amazon next June to spend two or three years in a house-boat, visiting the waters of the triangular section of territory northwest from Para, including a part of Brazil and a corner of British Guiana.

THE ARREST OF A PSEUDO RUBBER MAN.

The New York dailies of March 4 contained the story of a raid made the day before on an apartment on Riverside Drive, that city, and the arrest for alleged cocaine and opium smuggling of Tonko L. Milic, described as the "vice president of the Peruvian-Chamayro Rubber Co." The "Times" account contained this paragraph:

"Milic has traveled in South America. On his arrival in this country he established, the Federal authorities say, the Peruvian-Chamayro Rubber Corporation, and managed to sell some of its stock, although the District Attorney's office asserts that his interest in the plantations the company was supposed to own consisted merely of an option. The company until recently had offices at 60 Wall street."

The Peruvian-Chamayro Rubber Co. was incorporated, under the laws of Delaware, December 19, 1912, with an authorized capital of \$700,000. The incorporators were Tonko L. Milic, 60 Wall street; George R. Allison, 64 Riverside Drive—both in New York and Andrew E. Sanborn, Wilmington, Delaware, and the object of the company was to purchase, own, develop and sell lands and timber rights in the Republic of Peru, South America.

TRADE NEWS NOTES.

A company is being organized at Wichita, Kansas, for the manufacture and sale of automobile tires. The promoters of this enterprise are John J. Lane, of Wichita, and F. W. Blackwell, of Indianapolis, Indiana, the latter of whom has been connected for the past 12 years with The B. F. Goodrich Co.

The United States Tire Co. has opened a new sales branch at 16 Forest avenue, Portland, Maine, to serve the trade in that state and also in sections of New Hampshire and Vermont.

The Consalus Tire Co., although only recently incorporated, is not a new concern, having been in business as jobbers and dealers in automobile tires and tubes for several years, with headquarters at 336-8 Central avenue, Albany, and branch stores in Schenectady and Troy, New York. The company handles Mohawk and Gordon casings in addition to a line made under its own local brand, "Veeo." V. E. Consalus, president of the company, is the principal stockholder.

The output of the Fisk Rubber Co., of Chicopee Falls, Massachusetts, according to the annual report, has been at the rate of 2,700 tires per day for several months past.

J. W. Coulston & Co., of New York, importers and manufacturers of colors for the rubber trade, are showing especially prepared red oxides of iron for rubber tires and treads, and also rouge for water bottle manufacture.

The Goodyear Rubber Hose & Packing Co., of Philadelphia, has removed from 221 to 241 Chestnut street.

Figures sent out by the Firestone Tire & Rubber Co., of Akron, show a 78 per cent. increase in output for 1914 and an increase of 50 per cent. in number of dealers handling the Firestone tire.

The Excel Rubber Co., of Akron, whose capital stock was recently increased from \$10,000 to \$50,000, is making preparations to remove its plant to Wadsworth, Ohio, where it has secured a factory site.

The Gaulois Tire Co., of New York, which represents in this country the Etablissements Bergougnan, of Clermont-Ferrand, France, makers of the Gaulois tire, has reduced the price of this tire, in line with the reductions recently announced by the American manufacturers, about 21½ per cent.

The Simplex Wire & Cable Co., of Boston, has been awarded a contract for the manufacture and laying of a three-conductor submarine cable about a mile long, to be laid across Great Bay just above the city of Portsmouth, New Hampshire.

The Charles T. Wilson Co., Inc., of which Charles T. Wilson is president and which does a crude rubber importing business at 46 Cortlandt street, New York, has become a member of the Merchants' Association of New York.

The Thermoid Rubber Co., of Trenton, New Jersey, has opened an office and service department in the Dime Savings Bank building, Detroit, Michigan, with W. E. Carpenter, J. H. Liston and H. R. Portugal as factory representatives.

In a race at Salduro, Utah, recently, between a locomotive and an automobile, a record of a mile in 25.2 seconds, or at the rate of 142.85 miles an hour, was made by the latter, the track consisting of a bed of crystalized salt, giving a hard level surface offering almost no friction to the rubber tire tread.

A building has been erected on the Panama-Pacific International Exposition grounds at San Francisco for the convenience of visiting representatives of the press, to whom it will be open until December 24.

In 1914 the United States imported rubber waste to the value of \$26,537 from Denmark, as compared with \$30,527 in 1913.

MANHASSET MANUFACTURING CO.

The statement submitted at the recent annual meeting of the Manhasset Manufacturing Co., at Providence, Rhode Island, showed a net surplus of \$44,717 in quick assets over active liabilities. The largest item in the list of assets, with the exception of machinery and construction, was for raw cotton stock in process and finished goods, \$141,296. The company, whose plant is at Putnam, Connecticut, and whose main offices are at Providence, specializes in high grade automobile tire duck, the demand for which during the past year has kept the factory continuously operating day and night. A new weave shed is being added which will considerably increase present capacity. The officers elected for the year are: President, Edwin D. Livesey; vice-president, Albert Howarth; treasurer, Roland H. Ballou; secretary, H. J. Thayer. These officers, with the exception of the treasurer, are members of the board of directors, which includes also William S. Cheney, Arthur Lord and William Mourir.

ELECTRICAL SUPPLY MANUFACTURERS ORGANIZE.

An association of the manufacturers of electrical supplies was formed on March 9 at a meeting called for that purpose at the Hotel Biltmore, New York. It is to be known as The Associated Manufacturers of Electrical Supplies. A constitution and by-laws were adopted, and a board of governors, in whom the management shall be vested, elected. On this board, among others, are R. K. Sheppard, of The B. F. Goodrich Co.; A. W. Berresford, of the Cutler-Hammer Manufacturing Co.; D. C. Durland, of the General Electric Co., and LeRoy Clark, of the Safety Insulated Wire & Cable Co. The organization started with 41 members, each of whom may have one or more "executive" and "associate" representatives, whose annual dues shall be \$40 and \$10 respectively, with \$25 initiation fee. Members are divided into groups, according to the character of electrical supplies or materials they manufacture.

MANSFIELD TIRE & RUBBER CO. BUYS COLUMBIANA PLANT.

The Columbia Tire & Rubber Co. has been organized to take over the property and assets of the Columbia Rubber Co., of Columbiana, Ohio, which will be dissolved. The new company, capitalized at \$300,000 two-thirds common and one-third preferred stock, will be operated as an auxiliary of the Mansfield Tire & Rubber Co., of Mansfield, Ohio, a majority of the stock being owned by the present management and stockholders of that company, and the board of directors of the Columbia Tire & Rubber Co. being practically identical with that of the Mansfield concern. The factory at Columbiana was completed two years ago, at a cost, with equipment, of about \$135,000, and is said to be one of the finest in the state, but it has never been operated. W. G. Heme, sales manager of the Mansfield Tire & Rubber Co., will become general manager of the Columbiana concern, and A. E. Kraunach, formerly superintendent at Mansfield, has been appointed factory manager of the new plant. This purchase will not interfere in any way with plans for extension of the Mansfield plant.

THE AMERICAN CHEMICAL SOCIETY.

The date of the fiftieth meeting of this society at New Orleans, Louisiana, is March 31 to April 3, inclusive. The summer meeting of 1915 will be held at Seattle, Washington, August 31 to September 3, following which a day will be spent at Portland, Oregon, and the members will then continue together to San Francisco for a social session of one evening. A special train is being arranged for.

The American Chemical Society, organized in 1876, is one of the largest organizations of its kind in the world, having now more than 7,100 members. Membership is open to any reputable person interested in chemistry. The policy of organizing members into divisions has been adopted, and seven such divisions have been formed. There are also 45 local sections, situated in various parts of the country, which hold frequent meetings.

NEW INCORPORATIONS.

American Dirigible Balloon Syndicate, Inc., February 19, 1915, under the laws of New York; authorized capital, \$100,000. Incorporators: Israel Ludlow and F. Harrison Higgins—both of 297 Madison Avenue—and Hamilton Fish, Jr., 91 William Street—all in New York City.

Columbia Tire & Rubber Co., The, March 17, 1915, under the laws of Ohio; authorized capital, \$300,000. Incorporators: William G. Henne, Walter F. Henne, Jacob C. Henne, George W. Henne, Charles Hoffman and Jesse E. La Dow. To manufacture rubber tires and appliances for automobiles.

Consalus Tire Co., Inc., February 18, 1915, under the laws of New York; authorized capital, \$15,000. Incorporators: Victor E. Consalus and Margaret A. Consalus—both of 432 Clinton Avenue—and Edwin W. Sanford, 595 Central Avenue—all in Albany, N. Y. To deal in tires and auto goods.

Dan-Mar Corporation, The, February 25, 1915, under the laws of New York; authorized capital, \$25,000. Incorporators: Celia Solomon, 964 Eastern Parkway; David Greenbaum, 118 South Second Street, and Moses Lewis, 383 St. John's Place—all in Brooklyn, N. Y. To deal in devices for making tires puncture proof, etc.

Dimond Tire Sales Co. of Long Island, Inc., March 6, 1915, under the laws of New York; authorized capital, \$10,000. Incorporators: Thomas P. C. Forbes and Alexander Forbes—both of Freeport, and Julius Bindrim, 511 Lafayette Avenue, Brooklyn—all in New York.

Globe Rubber Co., The, March 10, 1915, under the laws of Ohio; authorized capital, \$20,000. Incorporators: F. A. Creque, F. C. Francisco, T. J. Francisco, L. H. Adams and W. B. Francisco. To manufacture a general line of dipped rubber goods.

Hardman Tire & Rubber Co., The, February 25, 1915, under the laws of Massachusetts; authorized capital, \$10,000. Incorporators: Frank C. Hardman, 63 Parsons Street, Brighton, George M. Foster, Peabody, and Ernest A. James, 29 Ruskin Street, Boston—all in Massachusetts. To deal in automobile tires, tubes and supplies.

Iowa Qualityre Co., March 1, 1915, under the laws of Maine; authorized capital, \$100,000. Incorporators: Albert F. Jones (president), A. B. Farnham (treasurer), James E. Manter (clerk)—all of Portland, Maine. Principal office, Portland, Maine. To manufacture, deal in and produce rubber, etc.

Leavitt-Mink Manufacturing Co., Inc., March 2, 1915, under the laws of New York; authorized capital, \$2,000. Incorporators: Nathan C. Leavitt, 180 Spruce Street, Newark, N. J.; Howard N. Hymes, 560 West One Hundred and Seventy-ninth Street, New York City, and Isidore Mink, 433 Miller Avenue, Brooklyn, N. Y. To manufacture rubber products, etc.

Michigan Qualityre Co., March 1, 1915, under the laws of Maine; authorized capital, \$100,000. Incorporators: Albert F. Jones (president), A. B. Farnham (treasurer), and James E. Manter (clerk)—all of Portland, Maine. Principal office, Portland, Maine. To manufacture, deal in and produce rubber, etc.

New England Qualityre Co., March 1, 1915, under the laws of Maine; authorized capital, \$100,000. Incorporators: Albert F. Jones (president), A. B. Farnham (treasurer) and James E. Manter (clerk)—all of Portland, Maine. Principal office, Portland, Maine. To manufacture, deal in and produce rubber, etc.

Powers Rubber & Supply Co., Inc., January 29, 1915, under the laws of New York; authorized capital, \$3,000. Incorporators: John C. Powers and Lena M. Powers—both of 749 Central Park West—and Warren A. Schonek, 55 Liberty Street

all in New York City. To deal in tires and other rubber goods.

Qualityre Rubber Co., March 1, 1915, under the laws of Maine; authorized capital, \$100,000. Incorporators: Albert F. Jones (president), A. B. Farnham (treasurer) and James E. Manter (clerk)—all of Portland, Maine. Principal office, Portland, Maine. To manufacture, deal in and produce rubber, etc.

Rapid Seal Distributing Co., February 10, 1915, under the laws of Delaware; authorized capital, \$100,000. Incorporators: Joseph A. Vogel, Harry R. Loose and George W. Collins—all of Wilmington, Delaware. The office of said company is with Mr. Harry R. Loose, Wilmington, Delaware. To manufacture, produce, purchase, sell and deal in any and all kinds of puncture healing liquids for tires.

Schmid-Lyon Rubber Co., Inc., March 9, 1915, under the laws of New York; authorized capital, \$100,000. Incorporators: Paul L. H. H. Henkel and Ossian G. Lyon—both of Akron, Ohio—and Julius Schmid, 470 Fourth Avenue, New York City. To manufacture rubber goods, surgical supplies, etc.

Strand Raincoat Co., Inc., March 22, 1915, under the laws of New York; authorized capital, \$5,000. Incorporators: Harold Sass and Gustav Sass—both of 104 Second Avenue—and Charles Goldsieger, 81 Norfolk Street—all in New York City. To manufacture rubberized clothing, etc.

Success Rubber Co., The, February 1, 1915, under the laws of Ohio; authorized capital, \$5,000. Incorporators: Clarence B. Keemer, John M. McCabe, Walter G. Kirkbride, L. M. Davis and Joseph L. Skeldon. To manufacture, sell, etc., rubber tires and rubber goods.

Utah Qualityre Co., March 1, 1915, under the laws of Maine; authorized capital, \$100,000. Incorporators: Albert F. Jones (president), A. B. Farnham (treasurer) and James E. Manter (clerk)—all of Portland, Maine. Principal office, Portland, Maine. To manufacture, deal in and produce rubber, etc.

THE MANSFIELD COMPANY WINS SUIT.

In the early part of March a case was tried in New York City in which Rossbach & Bros., dealers in crude rubber, brought suit against the Mansfield Tire & Rubber Co., of Mansfield, Ohio, for \$34,500, claimed for alleged breach of contract.

A contract was made between the importers and the Mansfield company in August, 1912, under which the company was to take 33 tons of crude rubber, to be delivered during the year 1913. The importers alleged that when rubber, in the spring and summer of 1913, dropped in price below that mentioned in the contract, the defendants refused to accept deliveries. The defendants alleged that the contract was first broken by the importers, who failed to deliver rubber under its terms promptly during the first part of the period covered, when the market price was somewhat above that mentioned in the contract. The jury found for the defendants.

CENTURY RUBBER WORKS ELECTS OFFICERS.

The Century Rubber Works, of Chicago, recently held its annual meeting, electing the following officers for the year: President, Frank Netzel; secretary, Henry Venn; treasurer and general manager, Charles J. Venn.

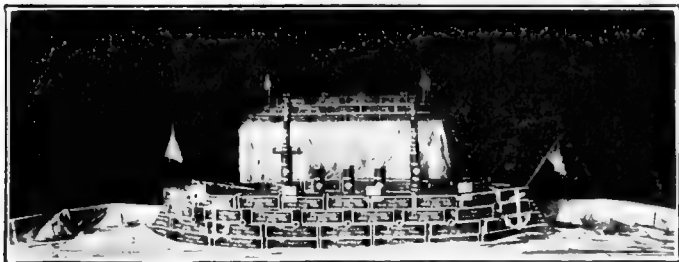
This company is now making hoof pads, bar shoes, rubber soles, plain and leather tipped automobile accessories, packing, and a general line of mechanical molded goods.

CRUDE OIL AND TIRES.

It is becoming customary in most parts of the United States to spread a coating of crude oil over newly finished macadam roads. Driving through a fresh coating of this oil is very hard on tires unless care is taken to remove the oil with a little soap and water at the end of the day. Crude oil is a bitter enemy of rubber and a few minutes passed in cleaning it from tires is time well spent.

CONVERTING THE HARMLESS INNER TUBE INTO A MAN OF WAR.

The present conflict has been marked by extraordinary development in naval warfare. Not to be outdone by other inventors of new floating engines of destruction, the Firestone Tire & Rubber Co. has produced a marine monster of novel design and formidable aspect. As will be noticed by close scrutiny of the accompanying photographic cut, the hull of this armored cruiser is composed of a number of boxes containing the Firestone "Pure Para Tube." The turrets and smoke stacks



are built of tubular boxes such as are usually used for tale and rubber cement. With the addition of a little cordage and anchors and lookouts made of cardboard, this floating fortress becomes complete. Properly to set it off, it is surrounded by a cloth-made ocean with an undulating surface and with a sprinkling of small sailing craft that act as convoys. This man-of-war, armored with inner tubes, was recently used for a window display and naturally, in the present warlike state of the public mind, attracted much attention.

IS THE NATIONAL RUBBER STAMP ASSOCIATION A TRUST?

The National Rubber Stamp Association and six of its members in Denver, Colorado, have been made defendants in a \$65,000 damage suit instituted by C. E. Buffington, a manufacturer of novelties. The complaint charges that as a result of the refusal of the association's members in Denver to furnish him with supplies he was forced to retire from business. The firms named are the Superior Rubber Type Co., the Denver Novelty Works & Electric Co., the Sachs-Lawlor Co., A. S. Carter, George Kauffman and the E. R. Callaghan Novelty Co., all members of the national organization, whose main offices are in Chicago. Buffington charges that the association is virtually a trust in restraint of trade, and \$50,000 of the amount sued for is being demanded as punitive damages.

SULPHUR PRODUCTION AND PROFITS.

Some interesting facts have been brought to light by the motion for reappraisal of 505 shares of stock of the Union Sulphur Co. owned by the late Herman Frasch, notice of whose death appeared, with a brief sketch of his career, on page 599 of our issue of August last. The net assets of the deceased were appraised at \$5,261,766, the shares in question being valued at \$1,136,250, whereas they are said to have a value of from \$25,000,000 to \$30,000,000. Investigation discloses that the company owned one mine in Louisiana appraised in 1911 by local tax officials at \$10,000,000; that the dividends yearly for the last three years from this mine had been more than \$4,500,000; that the profits of the year 1912 on the sale of 302,342 tons of the 786,605 tons of sulphur mined that year amounted to \$4,500,000, and that since 1911 the company has established plants at Cette and Marseilles, France, at Rotterdam, Holland, and at Hamburg, Germany. The widow and daughter of the late Mr. Frasch share equally for life the income from the estate.

The Republic Rubber Co., of Youngstown, Ohio, has leased a store in the Murray building, Grand Rapids, Michigan, for its branch in that city.

CENTURY RUBBER CO. ASKS FOR RECEIVER.

The Century Rubber Co., of Plainfield, New Jersey, recently made application to the United States District Court for the District of New Jersey for a receiver, and Frank P. McDermott, of Jersey City, was appointed. This application does not allege bankruptcy or insolvency, but states that owing to existing financial conditions the company was unable to collect its accounts and the business was being conducted at a loss. A receiver was therefore sought and appointed to conserve the assets, which, the bill asserts, at a fair value can be sold for a sum in excess of the indebtedness of the company and realize a substantial sum to the stockholders, the plant being wholly unencumbered and in good condition and there being no outstanding bonds.

The plant of the Century company is reported running full time under the receivership, and it is the hope and expectation of the company to not only fulfill all its contracts, but to shortly effect a reorganization.

TRADE NEWS NOTES.

The Hoggson & Pettis Manufacturing Co., of New Haven, Connecticut, which manufactures a line of tire makers' tools, shoe rolls, etc., is displaying at the Panama-Pacific Exposition now in progress at San Francisco.

Other eastern concerns exhibiting at this exposition, in the Palace of Manufactures, are the Foster Rubber Co., manufacturers of rubber heels, of 170 Summer street, Boston; the Live Leather Belt Co., of New York, manufacturers of the leather and rubber belt described on page 608 of our issue of August last, and the General Bakelite Co., of New York, which manufactures hard rubber substitutes.

The Grand Prize of the Automobile Club of America and the Vanderbilt Cup were both recently competed for on a course within the grounds of the Panama-Pacific Exposition, and both won by the Anglo-Italian, Dario Resta, in a French Peugeot racer, on Nassau tires. The Grand Prize was won under very trying conditions and the winning Peugeot carried Weed Chains throughout the 340 miles of the race, this being the first contest in which this device has been used.

At the annual meeting of stockholders of the Stoughton Rubber Co., of Stoughton, Massachusetts, held at the principal office of the company, 232 Summer street, Boston, March 23, Ira F. Burnham was re-elected to the office of president and treasurer, and Alvah H. Whitten to that of assistant treasurer. A board of directors was also elected, including, besides these two officers, Ellsworth H. Hicks, Charles A. Hunter and Lester Leland.

The Fisk Rubber Co., of Chicopee Falls, Massachusetts, has opened a branch house at 217 Washington street, Binghamton, New York, where a stock of tires will be carried for distribution in that section of the State and in Susquehanna and Bradford counties in Pennsylvania. G. C. Camp is manager of the new branch, one of 46 such stores now established by the company.

The factory of the Converse Rubber Shoe Co., in the Edgeworth district of Malden, Massachusetts, closed down on March 17 for annual inventory, repairs and improvements.

Records of sales by the Goodyear Tire & Rubber Co., of Akron, show that the straight side tire is making a great gain in popularity over the clincher type, sales of the former amounting to about 65 per cent. of the total in 1914, while the present season shows about 83 per cent. of the new cars using this straight side type of tire. In 1913 about 50 per cent. of the new cars were equipped with Q. D. clincher tires and rims.

A letter recently received from the Rubber & Celluloid Harness Trimming Co., of Newark, New Jersey, contains this paragraph: "The idea put forward by motor car promoters that the horse-drawn pleasure vehicle is passing is disproven by the experience of makers of hard rubber trimmings, their output for last year comparing favorably with former years in volume with good prospects for its continuance."

RUBBER TRADE INQUIRIES.

A firm in Europe desires to know if there is any prompt delivery of rubber goods.

[105] A firm of manufacturers in Great Britain writes us that they will soon be in the market for the following equipment, asking to be put in touch with manufacturers in a position to give prompt deliveries: High speed braiding machines for covering electric wire and cables, lead covering machinery, rubber mixing and calendaring machinery, cable makers' testing equipment and vulcanizing plant.

[106] An American manufacturer will be in the market in the course of the next four or five weeks for a complete line of machinery for equipping a small factory for the manufacture of mechanical rubber goods.

GOVERNMENT SUPPLIES.

Bids will be opened by the Bureau of Supplies and Accounts, Navy Department, Washington, on April 13, for electrical supplies, including "rubber, sheet, hard," under schedule No. 8,067. Schedules may be obtained upon application to the Navy Pay Office nearest each navy yard, or from the Bureau direct.

Sealed proposals will be received at the office of the Field Medical Supply Depot, United States Army, 21 M street, N. W., Washington, for furnishing combination hot water bags and syringes. For quantities and specifications application should be made to the above office. Report No. 2,160.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until April 6 for the following: Schedule 8016: air hose, rubber lined cotton hose, rubber fire hose, upper deck fire hose, unlined linen fire hose, garden hose, rubber fire hose, rubber hose to wash deck, and suction hose. Schedule 8017: flexible metallic copper hose, rubber hose, wire wound rubber hose, wire wound rubber steam hose.

Bids will be opened April 20 by the Bureau of Supplies and Accounts, as above, on 400 feet of 1 1/4-inch rubber hose, under schedule 8,097.

TRADE OPPORTUNITIES FROM CONSULAR REPORTS.

The representative of a large rubber plantation in the East Indies has informed an American consul that he is producing about 20,000 pounds of rubber per month (two-thirds smoked sheet, one-third crêpe) and that he desires to establish commercial relations with firms in the United States that might care to import rubber. Report No. 15,822.

A merchant in Greece wishes to communicate with American exporters of rubber for rubber stamps. Report No. 15,869.

A firm in Europe wishes to correspond with American manufacturers of rubber thread to be used in the textile industry. A sample of the style of thread desired may be obtained from the Bureau of Foreign and Domestic Commerce or its branches. Report No. 15,904.

A tobacco firm in the United States has informed the Bureau of Foreign and Domestic Commerce that one of its customers doing a general export and import business in Africa desires to find a market in the United States for gutta percha. Report No. 15,921.

A manufacturer in one of the neutral European countries desires quotations on material similar to samples of ramproof cloth which may be examined at the Bureau of Foreign and Domestic Commerce at Washington or its branch offices. Report No. 16,026.

The important role played by cotton in the rubber industry will be readily understood when it is stated that, estimating at 10,000,000 the tire production of the United States for 1915, about 45,000,000 pounds of cotton will be consumed by the American tire industry.

THE NAVY DEPARTMENT TO ASK BIDS ON DIRIGIBLES.

The United States Government has under consideration the establishment of government plants at New York and Philadelphia for the manufacture of aeroplanes, plans having been prepared by the Navy Department for such buildings, each to cost about \$30,000 and to be capable of turning out two or three machines a month at an individual cost of \$6,000.

The Navy Department is also about to experiment with dirigible balloons, to determine their availability for use on warships. One feature of this aircraft which makes it seem especially desirable in this connection is its ability to hover for long periods over a given spot. Specifications have been prepared for a dirigible upon which proposals will soon be invited. These call for a machine 175 feet long, 50 feet high and 35 feet wide, capable of lifting and carrying through the air at a speed of 25 miles an hour for two hours, a weight of one ton, in addition to crew and necessary supplies.

RECENT CUSTOMS RULING.

The board of United States General Appraisers has overruled the protest of the American Express Co. in the matter of duty on gloves composed of cotton and rubber. The company claimed such imports to be dutiable at 15 per cent., under paragraph 368 of the 1913 tariff act, whereas they were assessed at 30 per cent., under paragraph 256 of the act, which provides for "articles of wearing apparel of every description composed of cotton or other vegetable fiber and india rubber and not otherwise specially provided for in this section." According to the decision, this paragraph covers all articles of wearing apparel composed in part of india rubber, without regard to what is the component of chief value. The decision goes on to say that "the importer did not make the claim at the trial that the gloves in question are druggists' sundries, and on the evidence before us we hold that the merchandise is dutiable under paragraph 256 as returned."

TRADE NEWS NOTES.

An interesting lecture on "Tires, Their Use and Abuse" was delivered on the evening of March 11 at the West Side Young Men's Christian Association, Eighth avenue and Fifty-seventh street, New York, by G. J. Tietjen, factory sales manager and chief adjuster of the Rutherford Rubber Co., of East Rutherford, New Jersey. The lecture was given under the auspices of the automobile school of the Association, and at its close questions by the audience on the subject of tires were answered by the lecturer.

PERSONAL MENTION.

Victor van der Linde, whose retirement from the Century Rubber Co., of Plainfield, New Jersey, was announced in these columns several months ago, has become associated with the Union Tire & Rubber Co., of St. Louis, Missouri, as superintendent. The company intends to manufacture a high grade guaranteed tire and tube, later entering the market with a competitive line. The present capacity of the plant is stated to be 500 tires per day.

A serious accident recently occurred at the plant of the Vulcanized Products Co., at Muskegon, Michigan, when a vulcanizing press exploded. Of the two men working on the press at the time, one, Jay Caswell, was severely, if not fatally, burned, receiving nearly the full force of the escaped steam, and the other received painful injuries. The press, of course, was completely wrecked.

The Federal Rubber Manufacturing Co.'s branch at Minneapolis, Minnesota, of which H. F. Bigelow is manager, is to have new and handsome quarters at 1117 Hennepin avenue, plans being in preparation by the Milwaukee company for the erection of a building, two stories high, with basement.

The Elyria Wire & Rubber Co., incorporated early in March under the laws of Ohio, with a capital stock of \$250,000, will operate a plant at Elyria, Ohio, manufacturing the products from which it takes its name.

THE RUBBER TRADE IN BOSTON.

By Our Regular Correspondent

TAKING all accounts, by and large, opinions are most optimistic regarding future prospects for a good, busy season. The tire manufacturers say this is to be the greatest year in automobiling since the horseless carriage became a practicable business proposition. Those making tires hereabouts report good orders booked, and more in prospect, while agents of manufacturers in other states tell the same story. The rubber shoe factories are all busy. The season now closed has been a good one, and orders are coming in remarkably well for March business. There is but a moderate call for belting, but hose is in demand in anticipation of the suburban summer call, while there seems to be a better than normal demand for fire hose. The call for special hose for vacuum cleaners is on a steady increase. Druggists' goods always go well at this time of year, and the present demand is satisfactory. Rubber clothing makers are reasonably busy, with the men on the road hustling for business. Trade in rubber heels and soles is flourishing, and it is a pretty poor month when no new concern starts in this line.

* * *

The Needham Tire Co., which has just fitted up a factory at Charles River Village, has started operations with a capacity of 100 tires a day and with sales guaranteed for half that number. Messrs. Patterson, father and son, who were with the Patterson Tire Co., of Lowell, are both at the factory, taking personal charge of the manufacture, the distributors being J. H. & G. L. Atwood, of 182-184 Friend street. Needham tires are of the clincher, quick detachable and straight-side types, with plain and non-skid treads, the former selling with a guarantee of 3,500 miles' service, and the latter 5,000 miles.

News was received here early last month of the death of Frank H. Dodge at Laurel, California. Mr. Dodge was formerly superintendent of the Fells factory of the Boston Rubber Shoe Co., retiring a few years ago, when he went to Laurel and, with his son, secured an orchard and went into fruit raising. He had many friends in Melrose, where he was for a number of years a resident, and where he was prominent in beneficiary and fraternal organizations. He leaves a widow and a son, Robert, who was associated in business with him in California.

* * *

Rubber, from the Amazon to the shoe store, was recently explained to the class of the Shoe and Leather Continuation School by George E. B. Putnam, editor of the rubber department of the "Boot and Shoe Recorder," who illustrated his talk with lantern slides furnished by the editor of THE INDIA RUBBER WORLD. Mr. Putnam repeated his lecture to the Boy Scouts of his home town, Newton Centre, and by invitation will entertain his brother Masens with a similar talk on the same subject.

There may be ill-luck in the number 13, but certainly this has not applied to the Automobile Show held in Boston last month, which was the thirteenth annual exhibition of this nature. It is not yet announced how many attended, but it was somewhere near a quarter of a million people. Every day was a buying day, and many machines were sold, more than at any previous show, with plenty of "prospects" booked for future business. The outlook is for a busy season in New England, with a prospective demand for tires and other rubber accessories which will serve to keep the factories booming, even at a time when pessimists are prone to report that times are hard in some industries.

Quite a number of tire concerns had exhibits, and all of them appeared well satisfied with the attention given their display, and the sales they made.

Sterling Tires, made by the Rutherford (New Jersey) Rubber

Co., were exhibited by W. M. Cowles, the sales manager for New England. There was a practical demonstration in the method of making tires, two tires a day being constructed in full view of the many visitors who crowded around the booth to watch the expert maker.

The Enterprise Rubber Co., of this city, exhibited the G. & J. tires at its booth, which was in charge of R. L. Jackson, manager of the tire department. Prominent in this exhibit was a flashing sign showing the big seal of the United States Rubber Co.

"Imperial" tires were shown by the American Motor Equipment Co., G. S. Van Voorhis, the president of the latter company taking personal charge of the exhibit. These tires are made by the McGraw Tire & Rubber Co., of East Palestine, Ohio.

W. T. Underwood, branch manager, exhibited Miller one-cure wrapped tread tires, made by the Miller Rubber Co., of Akron, Ohio.

Mohawk Tires, also made in Akron, by the Mohawk Rubber Co., were shown by the Green & Swett Co., of Boston, Russell L. Green of that firm being in charge. Besides these tires, Mr. Green gave a continuous demonstration of the Sampson repair plug for inner tubes.

W. A. Ellis, of the Ellis Ward Co., waxed eloquent in talking Reliable tires and also Portage tires, which the company handles.

Salesman Duffie, who covers the Middle States as traveling representative for the Midgley Tire & Rubber Co., of Lancaster, Ohio, arranged an attractive exhibit of the steel wire embedded tires made by that company.

The Dujardin Rubber Co., of New York, sent its factory representative, J. H. Parsons, to install an exhibit and to extol the merits of the Economy tube to prevent blow outs. Mr. Parsons was kept busy explaining and demonstrating to automobile owners, who were interested listeners and investigators.

Another blow-out preventive was shown by I. Flexner, of Flexner & Gylling, New England agents for the inner tube armor made by the Interstate Manufacturing Co., of Mt. Clemens, Michigan.

Mr. Everett and Mr. Newcomb, of the Dayton Tire Co., of New England, were in attendance at the exhibit of Marathon tires made at Cuyahoga Falls, Ohio, by the Marathon Tire & Rubber Co.

V. J. Mulherin, New England distributor for the product of the Howe Rubber Co., of New Brunswick, New Jersey, proved himself an efficient demonstrator and salesman.

Much interest was manifested in the exhibit of the Triplex pneumatic inner tube, which to all intents and purposes enables the motorist to have on each tire three inner tubes, thus allowing for three punctures, blowouts or similar troubles, before it is necessary to remove and renew.

Harry Braender, vice-president of the Braender Tire & Rubber Co., of Rutherford, New Jersey, and F. E. Kelly, eastern representative, were on duty exhibiting the tires bearing the Braender name, and explaining their claims for superiority.

A crowd was to be seen at all times surrounding the booth where Sewell Cushion wheels were being shown and their ingenious construction explained. These wheels for motor trucks are made by the Sewell Cushion Wheel Co., Detroit, Mich., and their exhibit at the show was managed by E. H. Milliken, Boston representative.

The Dreadnaught Tire & Rubber Co., of Baltimore, was represented by C. C. Fox, New England manager. At this booth were shown several tires with remarkable records, among them one which had given a service of 11,328 miles, by George H. Robertson, the well-known racer, and which Mr. Fox considered capable of a thousand more miles. At this booth were distributed some very ingenious miniature models of Dreadnaught vacuum tires to which straps were attached, making them applicable for watch-fobs, a decidedly novel idea.

And speaking of advertising matter, Champion spark plugs were well exploited by the distribution of red rubber balloons on which the name was printed in white letters. Several thousand of these balloons were distributed at the fair and, besides, they were given to diners in the various fashionable dining rooms and cafés during the week of the show.

The Standard Woven Fabric Co., of Framingham, Mass., had a notable exhibit of Multibestos brake lining, friction tape and other rubber and cloth fabrics for mechanical purposes. This was in charge of M. D. Davieson and R. D. Northrop, salesmen for the company.

Not only is the factory of the Boston Rubber Shoe Co. busy on its standard lines of rubber footwear, but it is turning out an excellent quality of rubber soles, which are being sold quite extensively to manufacturers of leather shoes. Besides this, a large department is kept busy in making the Knu-Shu, a canvas-top, rubber-sole and heel working shoe which has attained a remarkable popularity.

George Randall (son of C. W. Randall, London agent of the Hood Rubber Co.), who came to this country to learn by practical experience in the Hood Rubber Co.'s factory the *modus operandi* of making rubber goods, returning home a year or two ago, was a member of one of the British regiments and went to the front with his comrades. The many friends he made while here will regret to learn of word having been received last month that young Randall was killed in action in a recent battle.

THE RUBBER TRADE IN CHICAGO.

By Our Regular Correspondent.

THE past month in the local rubber trade has been the best of the year thus far. The mechanical line has been the subject of an especially brisk demand from all sections of the Middle West and the West. Garden hose orders, which were slow in January and early February, have been coming with a rush for several weeks past, and a great deal of shipping on this item alone has been done. The several rubber clothing men interviewed declare that they have all the orders they can handle and that it is a question of getting the goods out promptly rather than of getting the orders.

Buck & Raynor, the large drug firm which has always featured rubber goods in the big store at the corner of State and Madison streets, the "busiest corner in the world," has started the erection of a fine new building two blocks farther south, at Adams and State streets. The structure is to be modern in every respect and a special department will be devoted to rubber specialties. The window space is to be constantly at the disposal of the rubber department, so that while the articles featured from week to week will be different, nothing but rubber goods will be placed in the windows. The company has offered a prize of \$100 to the person submitting the most suitable name for the building.

The sub-basement sales of rubber goods in the department stores here may become a thing of the past if certain legislation which is now planned passes the city council. Commissioner of Health Young has introduced a measure which calls for the elimination of the sub-basement for trade purposes, and from present appearances it is extremely likely that it will pass. The sub-basement sales have played an important part in the workings of the department stores in the past, being widely advertised to the foreign population. Mr. Young in a recent address stated that he believes thirty feet below the level of the street to be too far down to take the public to sell goods.

Edward G. Leszynsky, president of the Asphalt & Rubber Co., died recently at St. Luke's Hospital here after an operation for

appendicitis. He was one of the best known and most popular rubber men in the city. He had been ill only three days. He was a native of California and a graduate of the University of Heidelberg, Germany, and of Columbia University, New York. He leaves a widow and one daughter. The funeral was held at Racine, Wisconsin. He was 59 years old.

The Manufacturers' Rubber & Supply Co. has incorporated for \$10,000 and will conduct a business in this city. Automobile supplies and rubber goods in general will be handled. It is probable that a location at some point along "automobile row" will be selected as headquarters. The incorporators of the company are W. E. Anderson, W. R. Anderson, and N. Johnson. The company will carry some fine line of inner tubes for automobiles and motorcycles and will also pay considerable attention to the smaller rubber items of a practical nature.

Rubber firms that have been looking for contracts for hose and matting on some of the new buildings going up in the "loop" district are much disappointed over the fact that a strike among the lathers and wood finishers has tied up the work on a number of the jobs and thus delayed the granting of contracts. However, there is every chance, according to recent reports, that the labor trouble will be settled soon, and then the business will probably be given out without further delay.

The Consumers' Tire & Service Co. has incorporated in Chicago to own, hire, repair and let automobiles, tires, etc. All rubber accessories to automobiles will be handled. The incorporators are Lynn S. and Earl C. Snow, and Robert A. Stevens. All of the incorporators are well experienced in the automobile supply line, having worked with various concerns around the city.

About April 1 the Hamilton Rubber Manufacturing Co. and the American Belting Co., represented by Elmer E. Bast, at 168 W. Randolph street, will move to handsome new quarters at 1229 S. Michigan avenue, occupying the entire first floor and basement of one of the finest structures on "automobile row."

Another concern which is to move soon from present location is the New York Belting & Packing Co. However, the company will not move far, going from the present address at 130 W. Lake street to the building immediately next door. Repairs are now being made on the front of the building into which this company will move.

Five per cent. of the total gross sales of a commercial establishment is not too much to spend for advertising, according to the statement of Henry C. Lytton, president of the "Hub," and one of the oldest and most respected of the pioneer State street merchants, in an address before the Illinois Retail Clothiers' Association last week. Mr. Lytton said that as he grew in years and experience he would even feel inclined to increase this per cent.

GOVERNMENT IN CONTROL OF PROCESS FOR PRODUCING BENZOL AND TOLUOL.

A process has been discovered, according to a report of the Secretary of the Interior, by Dr. Rittman, a chemical engineer employed by the Bureau of Mines, for the derivation from crude petroleum of benzol and toluol, for use in making high explosives and aniline dyes, and a co-operative arrangement has been entered into between the Bureau and a company which manufactures explosives for the establishment at Pittsburgh of a plant costing not less than \$200,000 for carrying on this work. Patents have been issued on the process and under the contract all devices, improvements, etc., developed at this experimental plant are to be "subject to patent by the Bureau of Mines, for the benefit of the public."

THE RUBBER TRADE IN RHODE ISLAND.*By Our Regular Correspondent.*

THERE has been a general revival of trade among the rubber factories throughout the State, which are now surpassing all records made in previous years. All are running to capacity, with some contemplating an overtime schedule. In the case of automobile goods, especially tires, the demand is heavy, due to the fact that many of the manufacturers of trucks and pleasure machines have put off until now the placing of orders for equipment.

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The Revere Rubber Co. has started on an overtime schedule, its plant in Providence at present being operated three nights a week with a possibility of soon making two complete shifts daily to keep pace with the orders. This increase is said to be entirely on domestic orders, little, if any, of the product being for European shipment.

* * *

The Washburn Wire Co., of Phillipsdale, according to its annual statement recently issued, earned dividends of 7 per cent. on preferred and 7 per cent. on the common stock for the year 1914, the profits being \$269,255.31, or \$6,755.31 more than required to pay full dividends on both classes of stock. The surplus now stands at \$1,270,724.03, against \$1,263,968.72 a year ago. Profits, however, were \$372,907.28 one year ago, after deducting a depreciation of \$106,815.76 on machinery and buildings. The proportion of liquid assets to total assets continues to be very satisfactory, and the floating debt was much reduced during the year 1914. The dividend rate on the common stock was not raised from 5 to 7 per cent. until the April quarter of 1914.

* * *

The boom reported a month ago at the National India Rubber Co., Bristol, continues, and if anything is more decided than at that time. The lawn tennis shoe and insulated wire departments at present have a payroll of 2,300 employees, and this number is being daily increased, as fast as competent help can be secured. The congestion in the residence districts has been so great that a plan is being developed for erecting quite a number of new houses as tenements for the operatives. The big D'Wolf Inn, which has been used for several summers as a hotel, has been leased by the National company and fitted up as a boarding place for the additional women employees, of whom some 200 are thus accommodated.

The National company is having new buildings erected to connect its storehouses on Wilson's lane, thus adding materially to the size of the factory. A new office has been constructed in connection with the shipping end of the wire-insulating department, and additional trackage has been added for the handling of the increasing freight.

Fire escapes have been placed on the company's three-story building at Wood street and Wilson's lane, formerly used as a storehouse, but now transformed into a shoe-making department and new stitching room.

William W. Franklin, son of Superintendent James W. Franklin, of the National company, and an assistant to his father at the works, died during the past month.

William Moffett, who had been employed at the National company for about 40 years, died suddenly on March 5 from grippe and Bright's disease. He was 65 years of age and at the time of his death held a responsible position in the tennis shoe department.

* * *

Colonel Samuel P. Colt, president of the United States Rubber Co., has at his home in Bristol a high-power Mercedes touring automobile of some historic interest, having been returned to him by the French government. It arrived at Bristol on

March 8, and is in good condition, although it had been used in the war zone by the French for some time. Colonel Colt had this car with him last summer in Europe when the war broke out. At that time the French government was requisitioning all automobiles for military service use and Colonel Colt gave his car to the government, never expecting to see it again.

* * *

On March 22 Edward P. Metcalf, former president of the defunct Atlantic National Bank of this city, through whose failure the Walpole Tire & Rubber Co., of Walpole, Massachusetts, and the Consumers' Rubber Co., of Bristol, became financially embarrassed, was sentenced by Judge Brown in the Federal District Court, to serve 5 years in the Rhode Island State Prison at Cranston, on ten counts contained in three indictments, to run concurrently, on charges of misapplication of funds of that bank. Much interest has been manifested among the stockholders of the Walpole and Consumers' companies in the affairs of the defunct bank.

Earlier in the month the Walpole Tire & Rubber Co., which has been in receivers' hands for more than a year, was sold at public auction to a committee representing the creditors, for \$780,000. The Atlantic National Bank held a large amount of the Walpole stock when it went into the hands of a receiver, and it was on petition of the bank that the Walpole company was finally forced into a receivership.

THE RUBBER TRADE IN TRENTON.*By Our Regular Correspondent*

THE supply houses are much concerned over their inability to get antimony compounds—which are used largely by the tire makers—and substitutes are being employed wherever possible. The European war situation has resulted in the cutting off of all importations of this important article and there is said to be none of it procurable in Trenton. One Trenton importing firm is said to have sent a special messenger to London in an effort to obtain a supply. Just what success he had could not be learned.

Another result of the war felt by rubber mills here is the great falling off in orders for rubber carriage cloths, which in former years have found a big sale in the South. The inability of the cotton growers to realize on their crops is said to be the direct cause of this condition.

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The tire people are finding that there is an ever increasing tendency to abuse the "guaranteed mileage" feature of their goods and some steps will doubtless be taken in the near future to correct existing evils. The Consolidated Rubber Co. has taken the first step in this direction by planning a publicity campaign exploiting a "non-guaranteed" tire. A number of jobbers who have been approached have given their approval to the scheme. The Consolidated people explain that the absence of a guarantee will enable them to market their tires at a lower rate and that everybody along the line from the maker to the user will ultimately benefit. The non-guaranteed tires will, with ordinary care, average as high a mileage as the guaranteed goods, it is claimed, and there will be an incentive for the user to avoid abusing them unnecessarily. Many of the claims on the makers of guaranteed tires have been manifestly unjust, but they have been taken care of rather than raise an issue which might reflect in any way upon the makers.

The scourge of the guaranteed tire maker is the legion of speeders who, relying upon the modern mechanism of their cars for quick control, speed up to within a short distance of the stopping point and then set powerful brakes to grind the very life out of the rubber. The improper adjustment of

chains forms another serious problem for the manufacturers of automobile goods to cope with.

The Midvale Steel & Iron Co. has purchased equipment in this city for the setting up of a large reclaiming mill near Youngstown, Ohio. It is said the Midvale people will shortly branch out extensively in the making of special lines of rubber goods.

The Home Rubber Co. reports a satisfactory outlook for business this season. A force of painters recently brightened up the woodwork of the plant.

The opening of the Dehon Tire & Rubber Co.'s plant was an auspicious event. Former Governor Stokes was to have delivered the principal address at the opening exercises, but was unable to attend. Former Senator Harry Leavitt took his place, bidding the new concern a hearty welcome to the growing family of Trenton's rubber industries. Many men prominent in the business life of Trenton and other New Jersey points were in attendance. Luncheon was served in the plant. A feature of the occasion was the making of a tire complete, with the exception of vulcanizing, in the presence of the visitors.

A local rubber manufacturer, who for the present does not wish his name mentioned, has received a large order for rubber covered smoking pipes which have heretofore been imported from Germany. The pipe has a red clay bowl which is covered with hard rubber on the outside. The mouthpiece is also of rubber. The same company is also said to be negotiating with importers for the manufacture of several other novelties formerly bought in Germany.

The Keene Shock Absorber Co. is the name of a new concern which proposes to lease to rubber companies the right to manufacture a new style rubber heel and sole. Professor George A. Keene, widely known as a writer on health topics, is at the head of the proposed company, and steps have already been taken toward the incorporation of the concern. Application has been made for a patent on Professor Keene's rubber heel. It is said the heels can be worn on any pair of shoes selected for the day. The change from one pair of shoes to another will take about one minute and the method of changing is very simple. The Keene heel differs from others in that it has a pneumatic feature which is said to be eminently practical. A number of sealed air chambers add to the elasticity of the rubber.

Professor Keene has long been experimenting with the air chamber feature, but until recently he has not been successful. Another patent applied for by him covers an arch support made of rubber and said to be greatly superior to the use of metal construction.

The tire makers of the Hammond Rubber Co. recently held a banquet of vaudeville entertainment at the Hotel Hamilton.

The Hammond company is particularly proud of the fact that "Nassau" tires were used on the car of Resta, who won the recent Vanderbilt Cup Race. The tires used in the Vanderbilt race were the same ones which carried Resta to victory in the Grand Prix race a week before. The triumph for an American tire is all the more noteworthy when it is considered that the Grand Prix was run over roads made extremely dangerous by rains. It was necessary to use chains to prevent skidding and these subjected the tires to a terrific grinding which, however, did not harm them materially.

A unique social event was held recently by the Pilgrim Presbyterian church in this city, at which the price of admission was a piece of some sort of rubber. A great pile of parts of tires, worn out gum shoes, etc., was left in the church vestibule.

Rubber air brake hose may make possible the saving of more than a million dollars a year for the railroad companies operating in New Jersey. This was brought out at a recent inspection of railroad equipment held in this city for the benefit of the members of the Legislature, newspaper men and others interested in the fight the railroads are making to have repealed the "full crew law." The railroads contend that with the air brake equipment their trains can be safely handled without the extra man the law now compels them to hire. The senators and assemblymen who saw the air brakes work were much impressed.

Suit for divorce has been entered in the Court of Chancery here by Mrs. Mary E. Magowan against Frank A. Magowan, formerly one of the largest rubber manufacturers in the country. Mr. Magowan was also former mayor of Trenton. The plaintiff alleges desertion and asks for alimony.

David P. Brand, of the American Rubber Co., which conducts a reclaiming plant on Perrine avenue in this city, has sold out his interests in the concern to D. Piano, who formerly conducted a rubber factory at Catasauqua, Pennsylvania, which was burned some time ago. The Trenton plant with which Mr. Piano is now connected will make rubber mats, heels and soles, in addition to doing reclaiming.

THE RUBBER TRADE ON THE PACIFIC COAST.

By Our Regular Correspondent.

A BILL introduced in the State of Washington by the Roads and Bridges Committee of the House, for the protection and preservation of public highways, is causing considerable concern to the freight companies and others operating heavy motor trucks. If passed, such a measure would make it unlawful for any person to operate or cause to be operated over any public street, road or highway any vehicle which, with or without its load, should be of such weight or should have any wheel or tire so made or so equipped with spikes, cleats, lugs or other attachments or projections, as to break, crack or injure such street, road or highway, or the surface, foundation or any other part thereof; and all road supervisors and county and municipal police officers and their deputies and employees are made police officers to arrest violators. Such an enactment would stop the use of what are known as "lug" tires and also tire chains, which are considered by drivers of heavy trucks necessary for the safe operation of these machines.

The recent reduction in tire prices and the drop in gasoline prices—which were from 18 to 22 cents less than a year ago—to the present price of about 10 cents a gallon are expected to lend encouragement to the use of automobiles through the West, the operating expenses being quite an item in the cost of owning a car.

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The tire distributing houses have all been getting in stocks of tires and making other necessary preparations for caring for the expected demands by eastern tourists during the spring and summer.

Charles A. Gilbert, general sales manager of the United States Tire Co. of California, has recently returned from a three weeks' eastern trip, during which he visited the home offices and factories of the United States Rubber Co. and

attended a convention at the Morgan & Wright factory of district sales managers.

Drivers of the jitney buses which are so rapidly growing in favor in this section, speak in high terms of the service given by the United States "Chain Tread" tire on these huge cars, claiming that they afford effective protection against slipping and skidding, to which cars of this size are especially liable.

Another tire that is meeting with favor in jitney service is the Savage, made by the Savage Tire Co., of San Diego, California. One company operating a line of these buses in and about Los Angeles states that this tire is now one of the most popular in the western market for this kind of service, having given more than 10,000 miles' service in some instances and being still good for further use.

An unusual record of tire mileage comes from the northern section of California, where the roads are notably rough and rocky and where a tire that lasts for 3,500 miles is considered to have given good service. The tire in question, a Goodrich, is reported by its owner to have run 17,000 miles, on a heavy car, without having been off the rim, without a puncture and "you might say with the original air still in the tire."

The Republic Rubber Co., of Youngstown, Ohio, has established a branch at Spokane, Washington, the Inter-State Rubber Co. of that city having taken the Republic line for that section. The Inter-State company will hereafter be operated and known as the Spokane branch of the Republic Rubber Co. of California, and R. N. Church has been made vice-president of the new organization. The Republic Rubber Co. of California, of which M. E. Murphy is president, has its headquarters at San Francisco, with branches at Los Angeles, Seattle and Vancouver.

The Weinstock-Nichols Co., one of the largest tire jobbing houses on this coast, has made arrangements with the Kelly-Springfield Tire Co., of Akron, for the handling of its line, both at San Francisco and at Oakland, California, where it has a branch store.

The Hardman "Sure Grip" non-skid tire, made by the Hardman Tire & Rubber Co., of Belleville, New Jersey, is being distributed on the coast by The Costello-Lang Co., of San Francisco, who are also distributors of the Falls tire, made by the Falls Rubber Co., of Cuyahoga Falls, Ohio.

Among the exhibitors at the Panama-Pacific International Exposition now being held at San Francisco, are the United States Rubber Co. of San Francisco, who have a display of rubber heels, and the Bowers Rubber Works, also of that city, who show a complete hose making plant in operation. The display includes samples of crude Pará and Ceylon smoked rubber, with warming mill and calender for rolling the rubber out in sheets, a circular loom for weaving cotton fabric over rubber tubing for 3/4-inch garden hose and a flat loom for making underwriters' linen hose in sizes from 10 inches to 3 1/2-inch. Various products manufactured by the company are also exhibited, including dredger sleeves, concentrator belts, oil hose, sheet and spiral piston packings, etc.

These exhibits will be found in the Palace of Manufactures, one of the main group of eight exhibit palaces, 475 x 552 feet in size, with a floor area of 234,000 square feet, and erected at a cost of \$341,069.

RUBBER BAND KILLS A PRIZE ROOSTER.

A sign conspicuously displayed at the Poultry and Pigeon Show recently held at Madison Square Garden, New York, warned visitors against throwing rubber bands about, as "the chickens take them for worms." The posting of this sign followed the death of a valuable rooster as a result of mistaking for a worm a rubber band dropped, accidentally or otherwise, inside his cage.

RUBBER STATISTICS FOR THE UNITED STATES.

IMPORTS OF RUBBER AND MANUFACTURES OF

	January, 1915.	Same Month, January, 1914.	Ending January, 1915.
	Quantity.	Value.	Quantity.
Imports of rubber and manufactures of:			
Uncured rubber:			
Latex, in sheets, blocks, etc.	6,266	\$103,236	17,851
Gutta-percha, in sheets, blocks, etc.	136,517	136,517	6,000,834
Gutta-percha, in sheets, blocks, etc.	1,706,434	80,357	8,291,198
Gutta-percha, in sheets, blocks, etc.	6,180	16,136	1,859,606
India rubber, in sheets, blocks, etc.	7,660,488	3,833,044	73,003,407
India rubber, in sheets, blocks, etc.	83,133	18,710	6,847
Total uncured rubber:		\$4,999,960	
Manufactures of:			
Gutta-percha, in sheets, blocks, etc.		883	
India rubber, in sheets, blocks, etc.		2,299	
Total manufactures of:		\$4,482	
Substitutes, caestics, and similar:		8,401	
			\$22,503

IMPORTS OF CRUDE RUBBER BY COUNTRIES.

From:	Quantity.	Value.	Quantity.	Value.
Belgium:	1,901,370	\$60,872	1,901,370	\$60,872
France:	2,709,7	\$13,954	579,214	\$36,006
Germany:	73,118		73,118	\$38,088
Portugal:	14,663	14,663	1,798,119	\$38,906
United Kingdom:	947,06	1,747	38,680,098	1,683,602
Central American States and British Honduras:	6,356	27,536	254,805	107,447
Mexico:	69,648	9,437	1,241,417	468,962
Brazil:	8,163,183	1,410,676	2,660,185	10,994,561
Other South America:	246,343	108,661	21,2380	922,332
East Indies:	317,475	232,060	1,719,997	6,138,944
Other countries:	1,149,736	747,741	1,693,064	991,660
Total:	7,960,488	\$3,833,044	73,003,407	\$34,691,730

EXPORTS OF AMERICAN RUBBER GOODS.

India rubber, manufactures of:	Quantity.	Value.	Quantity.	Value.
Scrap and old:	140,357	\$14,898	1,224,434	\$127,199
Reclaimed:	512,866	67,856	3,379,915	463,401
Beltine, hose and packing:		115,311		1,095,519
Boots and shoes:				
Boots:	45,400	95,882	255,193	574,333
Shoes:	478,684	6,8735	1,64,298	1,753,717
Tires:				
For automobiles:		353,916		1,908,557
All other:		36,499		2,3508
All other manufactures of:		236,669		1,593,110
Total:		\$1,543,766		\$7,739,344

EXPORTS OF AUTOMOBILE TIRES BY COUNTRIES.

Tires for automobiles:	Quantity.	Value.	Quantity.	Value.
Germany:				\$6,190
England:		\$165,715		\$91,660
Canada:		41,317		338,066
Mexico:		15,197		60,856
Philippine Islands:		25,079		1,35,161
Other countries:		109,608		466,724
Total:		\$353,916		\$1,908,557

IMPORTS OF FOREIGN MERCHANDISE.

India rubber, crude and manufactures of:	Quantity.	Value.	Quantity.	Value.
Comman, crude:				
Latex, in sheets, blocks, etc.	177,836	\$71,893	658,175	\$266,463
Gutta-percha, in sheets, blocks, etc.			3,460	1,488
India rubber, in sheets, blocks, etc.	507,565	312,942	4,098,375	2,252,979
Total comman, crude:		\$384,735		\$2,520,930
Manufactures of:				
India rubber, in sheets, blocks, etc.		81,593		\$5,409

STERLING GUM CO.

The balance sheet of the Sterling Gum Co., of New York, as of December 31 last, shows liabilities \$127,586 in excess of assets, these being, respectively, \$6,002,313 and \$5,874,727. It is explained that this apparent loss is more than covered by the expense incurred in building the business and in brand values. The sales of the company in the United States and Canada for the 8 months it has been in operation are given as \$744,081. The board of directors was increased at the last annual meeting to nine members and now includes Percival S. Hill, president of the American Tobacco Co., and A. L. Sylvester, president of the American Cigar Co.

The India Rubber Trade in Great Britain.

By Our Regular Correspondent.

GENERAL COMMENT.

RECENT political events culminating in the exchange of notes between America and the principal belligerents have had the effect of soothing the irritations in our trade circles, to which I made brief reference in my last letter, and rubber men are again saying only pleasant things about America. Possibly the case may be different in Berlin, but I shall not pursue the topic except to remark that, however much the general American press may have on occasions departed from professions of neutrality, the international subscribers to THE INDIA RUBBER WORLD have found nothing in its pages suggestive of bias to one side or the other engaged in the titanic struggle. The article by the editor in the January issue, entitled "What Manufacturers Want in Crude Rubber," has been read with interest on this side, and with general agreement.

Trade conditions generally remain much as they have been during the last three months, those firms not engaged on Government work reporting home trade as decidedly quiet. Deliveries in regard to Government contracts are being kept well up to time. In regard to waterproof clothing, inspection of deliveries at Pimlico is reported as being almost as stringent as in peace time, but, although there have been a few rejections, the bulk of the work done has passed satisfactorily—a matter of congratulation to the firms concerned, in these times of rush. The manufacturer's main difficulty has been in obtaining sufficient hands, especially spreaders. With regard to men joining the colors it is noticeable that the list of firms in Lancashire issued at the end of February whose men are not to enlist is considerably shorter than the original list. The new list comprises only 35 firms, against 80, and no rubber manufacturers occur in it. I don't know what is the case at Birmingham, where exemption was granted to the Dunlop company, so busily engaged in making tires for the war office.

Owing to the rise in food prices various classes of industrial workers have agitated—and in most cases successfully—for a proportionate rise in wages; that is, an increase of 20 per cent. Naturally those of the clerical staff on moderate salaries feel that they ought not to be overlooked, though their claims have by no means met with prompt recognition. The Dunlop Rubber Co., Limited, should, however, be mentioned as having increased wages and salaries. Of course firms engaged on large Government contracts are better able to do this than are those not so fortunately situated. The treasury regulation regarding the issue of new capital has caused considerable perturbation in certain rubber plantation circles, but who is not being perturbed now-a-days by some regulation or other? Although in some cases the treasury embargo has been withdrawn, this is not so with intended rubber plantation issues, on the ground that increased production of rubber is not at the moment a matter of necessity, no shortage of supply for national purposes being apprehended.

RECLAIMED RUBBER.

In more than one quarter I hear that the sales of reclaimed rubber are now more satisfactory in the matter of quantity than has been the case of late. There are of course various ups and downs in the business, brought about by the war. Russian reclaimed, which has had a considerable sale in Great Britain of late years, is now completely cut off, owing to ice, while American reclaimed destined for Russia via England was too late to get through owing to delay in obtaining the necessary permits. Since Germany made Swedish wood cargoes contraband, Sweden has retaliated by making rubber contraband and entirely prohibiting its export. This has made it easy for British reclaimers

to send their product to Sweden, but at the same time it has cut off the supplies of waste rubber which some of our reclaimers have been in the regular habit of getting from Sweden.

Naturally, British and American products have, for the time being at any rate, taken the place of the Russian, thus leading to an accession of business for the former; and in this friendly competition high freights have been against the Americans. An increasing amount has come to England in the last few years from a large French mill, but very little from Germany, where reclaiming is carried on at the rubber factories for home use. The aftermath of the war must assuredly bring to hand large stocks of old tires, judging by the number of new ones that have been made during the last seven months, but so far I have not heard of any bulk of old tires from this source coming on the waste market. Of course the modern band tire stock is not in particular favor with reclaimers, who much prefer pneumatic tires. Not only is there about double the amount of mineral in the band tires, but in order to cure the vulcanite layer they have a much longer vulcanization, with the result that they produce a good deal of fine material when put through the rolls. Of course band tires are by no means exclusively used in the war area, large numbers of pneumatics having also been sent out. Even if these do not in the bulk come back direct to England but go into stock in France the effect will be much the same with regard to prices ruling in the rubber scrap market.

FIRES.

Two rather serious fires in the spreading departments of rubber works occurred in February. The first was at the Aston works of the Dunlop Rubber Co., Limited, Birmingham, a 4-story building being involved and much machinery seriously damaged. The second was at the works of the Premier Waterproof & Rubber Co., Limited, Manchester. Here the damage done was even more serious, necessitating total suspension of the spreading department, which was at the time busily engaged on Government work. Fortunately the warehouses adjoining the gutted premises were unaffected.

THE INDIA RUBBER MANUFACTURERS' ASSOCIATION.

At the annual meeting held February 3, in Manchester, Mr. James Tinto in the chair, the following officers were elected for the current year: Chairman, James T. Goudie; vice-chairman, Peter Bate (Castle Rubber Co., Limited, Warrington); committee, P. A. Birley (Chas. Macintosh & Co., Limited); J. H. C. Brooking (St. Helens Cable & Rubber Co., Limited, Warrington); R. Eccles (F. Reddaway & Co., Limited); Viscount Grimston (St. Albans Rubber Co.); W. M. Henderson (Ancoats Vale Rubber Co., Limited); David W. Moseley (D. Moseley & Sons, Limited); F. T. Swanborough (Avon Rubber Co., Limited), and James Tinto (Irwell & Eastern Rubber Co., Limited). Mr. R. Eccles took up the duties of treasurer in succession to Mr. W. M. Henderson. The new chairman, who is managing director of the Leyland & Birmingham Rubber Co., Limited, will have his work cut out if he is to emulate the zeal and attain the success of Mr. Tinto, who has held the position for the last two years. A mere glance at the committee shows its strength, but as there may be some to whom it does not appear quite representative of the British rubber trade, I may say that from the commencement of the association certain important firms have always held aloof, their abstention including the North British Rubber Co., Limited; Wm. Warne & Co., Limited, and the India Rubber, Gutta Percha & Telegraph Works Co., Limited, Silvertown.

PARA SYNTHETIC RUBBER.

Though possibly Messrs. Muller & Co., the sole selling agents, as also the agriculturists of Tipperary, may have given up this commodity as a bad job, I understand that Mr. Roberts and his chemist are still working at this problem, on the principle that what has been done once can be done again. This of course raises the point as to whether it has been done once. Mr. Russell, the patentee, is still working with Mr. Roberts, while Mr. Metcalfe has dissociated himself from the enterprise and is now making reclaimed rubber at his Gloucestershire works.

RUBBER CHEMICALS.

The price lists of rubber chemicals published in recent numbers of THE INDIA RUBBER WORLD, though by no means a new feature in American trade journalism, are somewhat of a novelty to British eyes, and those dealers in chemicals who keep their doings as quiet as possible are not over-anxious for the novelty to be emulated on this side. Of course, compared with thirty years ago, there are today very few specifics or chemicals sold under fancy names on the rubber chemical list—large profits on chemicals being a decided exception rather than the rule now-a-days.

The reference to the possible shortage in barytes in America does not seem well grounded, though certainly in regard to this article England must certainly hold a stronger position than any other country, her output having increased while other countries' outputs have declined. A few months ago I gave some statistics, which I may perhaps now be permitted to supplement by more recent figures. The United States output, which was 50,000 tons in 1909, fell to 34,877 tons in 1911, and to 34,000 tons in 1912. On the other hand, Great Britain's output has shown an increase from 45,000 tons in 1912 to 50,000 tons in 1913. What effect the war has had upon the United States production I do not know, but it has certainly increased the British output and has caused activity at Canadian deposits. Continental figures remain much as they have been for years, except that the Belgian output rose considerably in 1912. As the total production of Germany—practically all from Bavaria—was 27,000 tons in 1912, it seems obvious that the large business done by Germany in the various barium compounds depends to some extent on imported raw material obtained from France and Belgium.

Passing on from this topic, the fact that sulphur and golden sulphide of antimony is now absolute contraband means that our rubber chemical dealers are put to the trouble of applying for special permits in order to do business out of the Kingdom. Looking generally at the list of American prices it is noticeable that the high price of flowers of sulphur is much the same as here, despite home production in America.

THE WORLD'S RUBBER PRODUCTION FOR 1915.

According to an acknowledged authority on the rubber market, the world's production of the commodity during the present year is not likely to exceed that of 1914. Last year's figures were approximately as follows:

Plantation, 71,977 tons; Brazil, 37,000 tons; rest, 12,000 tons; total, 120,977 tons. Percentage of increase 11.5 per cent.

For 1915 the estimate in question is:

Plantation, 85,000 tons; Brazil, 30,000 tons; rest, 5,000 tons; total 120,000 tons. Percentage of decrease, .08 per cent.

There are, however, so many elements of uncertainty in connection with the production of crude rubber that an estimate, however carefully compiled, may well prove to be wide of the mark by as much as 15,000 tons. For example, in view of the enormous area planted with rubber in the Middle East during 1910, and therefore now coming into bearing, there is bound to be a very big increase in the plantation outturn this year. The above authority gives the surplus as rather more than 13,000 tons, but it may quite easily run into 20,000 tons or more.

Then again, there is the unknown factor, Brazil. Notwithstanding an extraordinarily fluctuating market South America

during the past eight years has been a wonderfully uniform producer. Neither the high prices of the boom period nor the subsequent slump seems to have had much influence upon the outturn of Brazil. For 1910, when prices were at the high-water mark, the total production of Pará rubber was 40,800 tons, and in 1913, when the price pendulum swung to the opposite extreme, the total crop was 39,370 tons. Brazil is the most disconcerting and illogical factor in the crude rubber position, and it is just as likely to produce more, in a time of adverse market conditions, as less. One would suppose that if anything were calculated to upset the Amazonian industry it is the present European conflagration. It might reduce the production by as much as 50 per cent, but the odds are that it will not. The above estimate indicates a falling off of 7,000 tons from this source, but while the crop is just as likely to be equal to that of 1914, nobody would be surprised if it were 10,000 tons less.

As to the production of the rest of the world, there is bound to be a substantial reduction, and that is all one can say about it. However, it may be generally conceded that although individual items in the foregoing estimate may prove wide of the mark, the total, much on a par with that of 1914, is most in accordance with the probabilities.

DISCLOSED PERCENTAGES IN RUBBER GOODS.

Touching the question of plantation *versus* Pará rubber, a suggestion of considerable interest to the trade has recently been broached. It is pointed out that the user of rubber goods has no guarantee whatever as to the quantity of crude rubber, if any, contained in the articles he purchases. In connection with many other manufactures, definite guarantees are given, and it is contended, with some show of reason, that in these days of reclaim, rubber substitutes and what not, the purchaser of rubber goods is entitled to know a little more about the article he is buying. In view of the British public's large financial interest in the plantation industry, there is no doubt that, so far as this country is concerned, rubber goods endorsed with the legend "Made from pure plantation rubber," would command a better sale than similar goods unmarked. Assuming also that up to a certain point the more virgin rubber used in its manufacture the better the article, it is urged that manufacturers might go further and give the actual percentage of rubber contained in the goods. From the standpoint of plantation rubber producers, at least, the suggestion has much to recommend it. When prices of fine hard and plantation are on a par the user of the former is in reality paying approximately 25 per cent. more for his raw material, making allowance for loss in washing, than the buyer of plantation rubber. It is obvious, therefore, that the former could not compete with the latter on equal terms if the respective percentages of raw rubber in the manufactured goods were disclosed. I am convinced that there is a good deal in this suggestion, and that the trader adopting it would ultimately be well repaid for his enterprise. In the first instance, however, it would be necessary to educate the public by judicious advertising, explaining the relationship between the per cent. of pure rubber used and the quality of the goods.

PLANTATION AUCTION SALES.

Prior to the war plantation rubber had always been sold by public auction. When hostilities developed this system broke down and importers have had to resort to sale by private negotiation. This method has proved so satisfactory that it is now freely stated that the public auctions will never be resumed. It must be said, however, that market conditions are by no means normal, and consequently the comparison of the two systems is scarcely permissible. Owing to the congested state of the London docks, an unconscionable time is taken to unload rubber for the market, resulting in much greater delays than usual in receipt of supplies. It is therefore a question whether sell-

ing by private treaty would prove adequate if the rubber were being placed on the market with normal speed, though there is much to be said in favor of the present practice, especially from the standpoint of importers.

THE RUBBER TRADE ASSOCIATION OF LONDON.

The annual general meeting of the Rubber Trade Association of London was held on February 17, Mr. Edward Berg in the chair.

The chairman said that the members should felicitate themselves that the association had been organized and put on its feet in time of peace and had thus been able to be of great help to the trade in a period when nearly everything was disorganized. The committee had been called upon daily to solve most difficult problems, and it had never shirked. The members of the association, with practical unanimity, had supported the decisions of the committee, and by reason of this confidence trade had been carried on without interruption, while the Stock Exchange and other organizations had remained paralyzed for months.

Thanks were due to the Rubber Growers' Association and to the sub-committee (Messrs. Devitt, Meyer, Stevenson and Bower) for their valuable assistance, especially in the negotiations with the government, which had been so successful in relaxing the severity of the embargo on rubber shipments to the United States. The government had recognized the loyalty of the rubber trade in general with regard to trading with the enemy.

Out of 85 arbitrations during the year, 43 had been on questions of quality and more than half the remainder for fixing prices of admitted defaults. There had been but two appeals. The Qualities Committee had examined 7,872 samples, and 1,037 standard certificates had been delivered.

Mr. Andrew Devitt was appointed chairman, Arthur Meyer, vice chairman and J. Dudley Johnston, treasurer, for the current year.

BRITISH BIDS FOR HOME AND FOREIGN TRADE.

Authorization has been given by the Secretary of State for the Colonies for the formation of a Technical Information Bureau at the Imperial Institute, London. This has been brought about by the steadily increasing number of inquiries received at the institute relating to such subjects as the sources of raw materials supplies, the methods of utilizing new products and processes and machinery for industrial purposes. This bureau is expected to play an important part in the development in Great Britain and British Colonies of industries whose products have heretofore been imported from Austria and Germany.

The Board of Trade, London, has prepared a series of memoranda, giving information with regard to possible developments in certain important trades, which is furnished to British firms on application to the Commercial Industries branch of the Board. This includes information on rubber tires for automobiles and other vehicles, and other rubber articles. Samples of Austrian and German goods, collected in all the British Colonies and from most of the so-called neutral countries, are soon to be exhibited in London by the Board of Trade; and a fair, to be known as "The British Industries Fair," is to be held in that city from May 10 to 21, at the Royal Agricultural Hall, for the exhibition of articles of home production. Only articles of British production will be displayed, and admission will be by invitation, restricted to *bona fide* buyers for home and over-sea markets.

The Henry Pneumatic Tyre Co., Limited, is a new company, with a capital stock of £50,000, registered by T. H. Goodwin, 10, Basinghall street, London, E. C.

MR. STEVENSON RETURNS TO LONDON.

H. Stevenson, managing director of Aldens' Successors, Limited, of London, who arrived in New York in the early part of February, returned to London on the "Cameronia" March 6. While Mr. Stevenson came to this country on important business for his company, additional interest was lent to his visit from the fact that he was one of the members of the committee appointed by the London Rubber Trade Association to co-operate with the committee appointed by the Rubber Club of America in lifting the British embargo on crude rubber exports. Mr. Stevenson will be able to give full assurance to the British authorities that the engagements which the American manufacturers have entered into are being thoroughly and faithfully carried out.

MR. MANDERS RAISES A LARGE FUND FOR THE BELGIANS.

Mr. A. Staines Manders, of London, who, with Miss D. Fulton, his secretary, has organized the various international rubber exhibitions held in London and the one of two years ago in New York, has shown his organizing abilities in assisting the Belgians. He, with Miss Fulton's assistance, organized what was known as Belgian Flag Day, with the object of obtaining a nucleus of a Foundation Fund for the Belgian orphans. In sixteen days or, more properly, in sixteen days and nights—as Mr. Manders and Miss Fulton kept at their work almost constantly—he succeeded in collecting the large sum of £17,000, to which considerable additions will be made later.

A RUBBER CHART FOR THE YEARS 1910 TO 1914.

Edmund Schluter & Co., of London, have just issued a chart showing the fluctuations of South American and plantation rubbers for the five years from January, 1910, to December, 1914. This is a wall chart 30 inches long by 16 inches wide and finished with a wooden strip top and bottom so as to keep its shape. It shows at a glance the market activities of the various kinds of rubber during the period covered. As the fluctuations of upriver, ne, island, neg, negro head and crepe plantation are all printed in different colors, while caucho ball is printed in a broken line, the chart shows at once the position of each sort of rubber for every week during the year. Singularly, the highest price of upriver, ne—12s. 4d. [\$3]—occurred in the early part of 1910, or, to be more specific, in the third week of April, while the lowest price for that grade—2s. 6d. [\$0.608]—occurred almost at the end of the five-year period, or in the third week of December, 1914.

H. Welsh-Lee has become advertising manager of the Dunlop Rubber Co., Limited, of Birmingham, England.

An Italian officer, Captain Bini, recently put the rubberized fabric of his military dirigible balloon to a very severe test by ascending to a height of more than 10,763 feet. Returning to earth after a flight of nearly 6 hours the dirigible was in perfect condition, with plenty of gas and ballast left for a still longer flight.

Imports of manufactured rubber goods into Persia for the fiscal year ending March 21, 1913, included rubber overshoes to the value of \$107,192 and other rubber goods valued at \$18,219—all from Russia.

In 1913 crude rubber to the amount of 12,995 pounds was exported from British West Africa, as compared with 4,335 pounds exported in 1912, showing an increase of 8,660 pounds.

The British Gold Coast Colony exported, in 1913, 1,317,369 pounds of rubber, against 1,990,669 pounds exported by this colony in 1912, showing a decrease of 673,300 pounds, which can be attributed to the low run of prices in the European market.

From Sierra Leone 10 tons of raw rubber were exported in 1913. In 1912 there were no exports of rubber.

JAPAN'S COMMERCE IN CRUDE RUBBER AND RUBBER GOODS.

Re Our Regular Correspondent.

OFFICIAL statistics of Japan's commerce in crude rubber and manufactured rubber goods for 1914 show a slight decrease in imports of both these commodities, in value and quantity, with an increase of more than 100 per cent in exports of rubber manufactures.

The influence of the war has been felt, due to the interruption, in August, of rubber imports as well as all foreign telegraphic communications. During September and October small quantities of rubber, which was badly needed by the manufacturers, were imported from Shanghai and Hongkong, where many ships were detained. The embargo on crude rubber exports from British colonies seriously affected the Japanese trade and imports during November reached their lowest point, increasing in December to 145,273 pounds, valued at \$59,815. It is estimated that had it not been for the war crude rubber imports would have considerably exceeded those of 1913, corresponding with the decrease in imports of rubber manufactures. The following table shows crude rubber imports of 1914, with their sources, in comparison with those of 1913:

IMPORTS OF CRUDE RUBBER INTO JAPAN.
1913. 1914.

From	Pounds	Value	Pounds	Value
British India	346,333	\$7,728.81	496,676	\$2,632
Strait Settlements	1,677,000	\$85,000	1,646,776	\$7,230
Nor. C. Ind.	93,788	\$8,908	13,034	\$775
Genl. Brit. Ind.	4,025,600	\$98,868	224,200	\$8,815
United States	2,670,000	\$7,113.75	11,294	\$2,176
Other countries	89,688	\$83,184	1,288	\$786
Total	2,687,433	\$177,702.1	2,335,778	\$18,077.31

Imports of manufactured rubber goods decreased about 40 per cent, a decrease attributed to the fact that Japanese manufacturers are now producing rubber goods recognized by the people of this country as equal to those of foreign manufacture, with the exception of some special lines now in an experimental stage. In addition to the imports of manufactured rubber goods for the years 1913 and 1914 shown below, automobiles and parts (including tires) were imported to the value of \$249,211 in 1914, against \$555,023 in 1913, and bicycles and parts (exclusive of tires) to the value of \$517,548 in 1914 against \$1,065,141 in 1913.

IMPORTS OF RUBBER MANUFACTURES INTO JAPAN.
1913. 1914.

	Pounds	Value	Pounds	Value
Reclaimed rubber and in cake	45,800	\$1,267	87,000	\$43,368
Dental rubber	20,376	\$1,223	9,004	\$3,114
Soft				
Rolls and coils	155,405	\$4,006	1,51,133	\$4,264
Plates and sheets	90,606	\$1,066	88,856	\$3,193
Tubes	100,424	\$4,483	73,460	\$6,335
Belts and belting for machinery	54,678	\$2,771	39,433	\$7,077
Throat, strap, button, rings and washers	93,338	\$7,007	87,473	\$9,744
Other soft goods	63,740	\$4,103	30,100	\$1,774
Hard				
Lamps, jars, oil rolls, plates and sheets	41,077	\$7,075	36,395	\$3,544
Other hard goods	14,754	\$1,977	15,080	\$1,541
Bicycle tires	428,980	\$19,498	8,106	\$2,950
Insulated electric wire				
Insulated with rubber				
Submarine, telegraph, and telephone cables		\$5,791		\$63,245
Other armored cables	8,848,593	\$99,481	1,769,118	\$87,113
Flexible cords	40,677	\$12,378	14,330	\$2,730
Other cords	187,135	\$62,700	99,661	\$9,998
Rubber boots (pairs)	13,067	\$5,707	5,696	\$3,576
Over shoes (pairs)	35,833	\$17,737	28,343	\$1,488
Woven beltings for machinery and hose	605,676	\$80,300	389,376	\$4,004
Waterproof tissue	29,500	\$990	1,8874	\$4,333
Elastic webbing, cords and bands		\$4,103		\$3,178
Insulating tapes	185,009	\$9,360	56,333	\$1,006
Total		\$2,048,777		\$1,480,057

Although the disturbed financial conditions due to the war affected to some extent the home consumption of rubber goods, such demand as existed was supplied largely with the product

of the Japanese factories taking the place of European ones whose export has been prohibited. This prohibition of European rubber exports had also the effect of introduction of Japanese rubber manufactures into China and other parts of Asia, the trade with China showing a very gratifying increase in certain lines.

The following are the figures covering exports of rubber goods:

EXPORTS OF JAPANESE RUBBER MANUFACTURES.

Period	Value
1913	\$152,981
1914	\$204,713

There were also exported in 1914 jinnikishas and parts, exclusive of tires, to the value of \$204,713, against similar exports in 1913 to the value of \$152,981.

THE CONSUMPTION OF COTTON IN JAPAN.

Japan obtains most of her raw cotton from India. Imports of this material from the United States showed a constant increase until 1913, rising from \$14,361,734 in 1907 to \$32,395,577 in 1912. Cotton imports into Japan from the United States fell in 1913 to \$32,110,172, showing a decrease of \$195,405 as compared with the previous year. At the same time cotton imports from India, Egypt and other countries showed an increase for 1913. In that year Japan took almost half of India's cotton production, or quantities valued at \$71,519,586.

BOTTLE RINGS AND THE WAR.

Among the first rubber articles in Germany to be affected by war were the small rubber rings used in providing air tight stoppers for beer, soda and mineral water bottles. As soon as it was learned that the government intended to supervise and limit the use of crude rubber, brewers, wholesale manufacturers and holders of beer and Selters were active in purchasing all the rubber bottle rings they could obtain, with the result that such rings were soon selling at very high prices and a little later could not be obtained at any price.

As yet no substitute for rubber rings has been discovered. Paper, pulp, tinfoil and other rings and stoppers have been resorted to, but these can only be used once and do not take the place of the reliable rubber rings and discs. Black and dark gray bottle rings, made of rubber substitutes, are being used through necessity. These have not the quality of durability, but to a certain extent they take the place of rubber. It is questionable whether or not these rubber substitute rings will stand contact with certain mineral waters. However, "war rings" will have to be used until peace is established, and then the Germans will go back to the little red rubber bottle rings formerly so generally in use.

RUBBERIZED HEAD PROTECTORS.

A German inventor has recently patented a head protector made in whole or in part of rubber or material, which thoroughly protects the entire head of the wearer. This protector can be worn under a helmet, such as aviators wear, or any other style of headgear.

Another head protector, of German invention, designed especially for military use, is quite simple. It is cut from a piece of rubberized fabric, is triangular in shape and forms two lapets. A running string is attached to the upper edge of the protector and the wearer uses this string to fasten the gear to the outside of his helmet. He then folds the two lapets, right and left, under his chin and fastens them in a knot at the back of his neck.

Replete with information for rubber manufacturers, Mr. Pearson's "Crude Rubber and Compounding Ingredients"

RUBBER ARTICLES NEEDED IN WAR.

European soldiers in the field are happy, according to a contributor to a German paper, when they can gain possession of either rubber bath tubs or rubber wash basins. In fact, the wash basins are even more popular than the tubs, for they are lighter, take up less room, and soldiers at the front find more chance of using them than they do of using tubs. The men appreciate the facility with which these soft rubber articles can be rolled or folded into a light, compact package.

Rubber eating utensils would also be welcomed by the men at the front if they were so vulcanized as to avoid communicating the disagreeable taste of rubber to their food; but it has not been found possible as yet to prevent such utensils from cracking in use.

Rubber and celluloid collars and cuffs have become very popular among European soldiers on account of their lasting qualities and especially the facility with which they can be cleaned. It is not a very easy matter to get clean linen in the trenches.

Another demand for rubber, created by the war, is due to the extensive use of canned and preserved food at the front. Great quantities of rubber jar rings and washers are needed in the proper packing of these provisions.

SOME STATISTICS ON THE LARGER PLANTATION COMPANIES.

The Singapore share circular issued by Fraser & Co., of Singapore, which was discontinued for some time owing to the very small business done in plantation shares, has recently resumed publication. Its latest number gives some interesting statistics regarding plantations whose shares are traded in in the Singapore market. The table below gives some of these statistics relating to the larger companies, only those

sterling companies being taken whose paid in capital equals or exceeds \$200,000 and only those dollar companies being taken whose paid in capital equals or exceeds \$500,000.

COMPANIES CAPITALIZED IN POUNDS STERLING.

Name of Company	Date of formation	Capital Paid Up (In Pounds Sterling)	No. of Shares Issued	Rubber Production for 1914 in Pounds
Anglo Java & Rubber Produce Co., Limited	1910	£400,000	400,000	.....
Bukit Sembawang Rubber Co., Limited	1910	314,955	3,149,550	305,161
Chersonese (F. M. S.) Estates, Limited	1909	224,460	2,244,600	537,465
Dair Development Co., Limited	1903	492,470	284,890	.....
Highlands & Lowlands Para Rubber Co., Limited	1906	308,508	308,508	1,132,583
Kuala Lumpur Rubber Co., Limited	1906	210,000	210,000	1,122,974
Lanadron Rubber Estates, Limited	1907	295,000	270,000	1,241,508
Lumut Rubber Estates, Limited	1909	200,000	200,000	.....
Malacca Rubber Plantations, Limited	1906	328,964	328,964	3,341,175
Merlimau Rubber Estates, Limited	1909	209,965	2,099,650	821,600
Mount Austin (Johore) Rubber Estates, Limited	1910	450,000	450,000	.....
Nordana (Johore) Rubber Estates, Limited	1912	280,000	280,000	576,373
Rubber Plantations Investment Trust Limited	1909	725,000	1,400,000	.....
Straits Settlements (Bertam) Rubber Co., Limited	1906	200,000	2,000,000	2,178,267
United Serdang (Sumatra) Rubber Plantations, Limited	1907	226,423	2,264,230	2,091,171

COMPANIES CAPITALIZED IN DOLLARS.

Name of Company	Date of formation	Capital Paid Up (In Dollars)	No. of Shares Issued	Rubber Production for 1914 in Pounds
Ayer Panas Rubber Estates, Limited	1909	\$750,000	150,000	245,312
Bukit Timah Rubber Estates, Limited	1910	500,000	50,000	162,739
Changkat Serdang Estates, Limited	1910	700,000	70,000	122,704
Malakoff Rubber Co., Limited	1910	1,000,000	500,000	379,800
New Serendah Rubber Co., Limited	1910	600,000	300,000	118,846
Pulau Bulang Rubber & Produce Co., Limited	1910	2,405,000	228,000	.....
Tapah Rubber Estates, Limited	1912	530,000	53,000	202,776

BATAVIA A RUBBER MARKET.

There is at present a strong sentiment in Batavia in favor of the creation of a rubber market there which should sell crude rubber to the consumers direct, doing away with intermediaries. An important meeting, called to consider this subject, was held recently in Batavia, and the opinion was expressed that, as a result of the war, circumstances were at present very favorable to the establishment of such a market. A committee was appointed to draw up rules and regulations concerning the questions of contracts, brokerage, etc. The work of this committee is subject to the approval of a meeting that will be held when the opening of a rubber market in Batavia becomes a definite fact. Sales would be effected on the Amsterdam system. Planters believe that better prices could be obtained by selling their rubber in Java. This movement is supported by the Dutch government.

In 1914 the total rubber production of the Belgian-Javanese Rubber Plantation Co. amounted to 395,750 pounds. During the same year 26,588 pounds of crude rubber was produced by the



DIPLOMA AWARDED MR. PEARSON AT THE BATAVIA CONGRESS.

The illustration above is a photographic reproduction of a diploma awarded at the International Rubber Congress, held in Batavia last October, to Mr. Henry C. Pearson for his exhibit of specimens of wild rubber and rubber substitutes.

Some Rubber Planting Notes.

CEYLON VIEWS ON RUBBER.

AN official report by the Ceylon Commissioner to the Rubber Exhibition, just published, contains more that is of live interest than is usually met with in such reports. The following reference to crepe seems worth quoting. "In the Malay stand, thin crepe was the main form in which this grade was shown, while in ours, blanket crepe largely predominated. This fact is worth the attention of Ceylon planters. If milling is detrimental to the nerve of rubber, thin crepe, which is not milled so much as blanket crepe, should be the more desirable form in which to prepare this grade. Few had a good word to say for crepe, and of those who were there, few would have been found to recommend equipping new factories with creping machinery; yet it commands as good a market as smoked sheet, making allowance for ups and downs. It is clear, pure and dry, and manufacturers like it for certain classes of goods not requiring special qualities of nerve. I believe, however, that we shall find say in the course of the next decade—a diminution in the proportion of crepe turned out, as a result of the growing opinion that tearing it about on the plantations between rollers could not possibly improve the quality of the rubber, but, on the contrary, injures it, and that the only thing to be said for crepe is that it looks nice and is in a convenient form for handling. Creping destroys the nerve of rubber and reduces the strength, and one well-known manufacturing authority expressed the belief that it was at the root of complaints against plantation rubber."

PLANTATION AND HARD FINE.

The Ceylon Commissioner also states that he gave a good deal of attention to the question of the relative merits of plantation and hard fine Pará, and what struck him more than anything else was the stolid indifference of manufacturers to academic arguments and tests conducted by those who were not themselves manufacturers. Indeed, the disregard of the average manufacturer extended further than this, and included his brother manufacturers who differed from him. Learned discussions might be proceeding in the conference room upstairs, but he would sit serenely at his stand exhibiting no interest in them whatever. The lesson seems to be that it is futile to try and prove the manufacturer wrong by laboratory tests, to quote statistics tending to show the superiority of plantation over hard fine. A year or more ago tire manufacturers were timid about acknowledging the use of any plantation, because even producers did not seem to be very fond of their product when it came to buying tires for their own cars. Then one firm, endowed perhaps with clearer vision boldly threw off the mask, and now all are calling the world to witness that their tires are made almost entirely from plantation rubber. Moreover, such tires have become not only popular but fashionable.

GUARDING TREES AGAINST DISEASE.

Bark rot, a disease formerly very common in some rubber plantations in Ceylon during the Northeast monsoon, can be stopped by washing the tapping surface affected with a 20 per cent. solution of Carbolineum Plantarium.

It has been noted that in plantations where cocoa, jak or ficus stumps have been left after thinning out operations, root disease has affected neighboring rubber trees. Rubber stumps left in the same manner do not appear to spread disease, but as the disease is brought about by fungi, and experts believe it a matter of pure chance whether those fungi are injurious or not, it is preferable to do away with all stumps.

WAR AND CEYLON RUBBER PLANTATIONS.

When the great European war broke out the British male population of Ceylon was estimated at about 4,110, of which about 2,245 were men of military age, most of them holding responsible positions. Fully 70 per cent. of these men have joined the colors and are now serving their country in one way or another. Some, belonging to different volunteer regiments, were sent to the front, while others have been organized to take the place of the Royal Garrison Artillery in guarding the colony. The result of this is that the European staff on the plantations has been very seriously depleted, and the matter is of great concern to rubber estate agents on account of the difficulty of controlling native labor in the absence of sufficient European supervision. The planters are all patriotic and loyal, but they believe that, owing to the favorable turn the war has taken for the Allies, further efforts should not be made to raise recruits among the plantation staffs and they are protesting against any press campaign in favor of continued enlistments.

STRAITS SETTLEMENTS RUBBER EXPORTS.

An official cablegram received by the Malay States Information Agency from the Colonial Secretary, Singapore, states that the export of plantation rubber during the month of January amounted to 2,576 tons, as compared with 2,334 tons in December last and 1,181 tons in the corresponding month last year.

February exports amounted to 2,741 tons, as against 1,703 in the corresponding month last year. The following table gives the comparison, month by month, for three years:

	1913.	1914.	1915.
January	784	1,181	2,576
February	743	1,703	2,741
Total	1,527	2,884	5,317

These figures include transshipments of rubber from various places in the neighborhood of the Straits Settlements, such as Borneo, Java, Sumatra and the non-Federated Malay States, as well as rubber actually exported from the colony, but do not include rubber exports from the Federated Malay States.

FEDERATED MALAY STATES RUBBER EXPORTS.

An official cablegram from Kuala Lumpur states that the export of rubber from the Federated Malay States in the month of February amounted to 3,411 tons, as compared with 3,473 tons in January and 2,364 tons in the corresponding month last year. The following are the comparative statistics for three years:

	1913.	1914.	1915.
January	2,131	2,542	3,473
February	1,757	2,364	3,411
Total	3,888	4,906	6,884

Singapore United Rubber Plantations, Limited, produced 330,000 pounds of rubber in 1914.

Terbrau Rubber Estates, Limited, report a crop of 334,440 pounds for 1914, for which an average price of 2s. 2¹/₂d. (53.72 cents) was secured.

Kuala Lumpur Rubber Co., Limited, reports a yield of 619 pounds per acre and 6.22 pounds per tree.

Bukit Kajang Rubber Estates, Limited, report an increased production and a 15 per cent. dividend.

Rubber plantations on the Island of Singapore cover 20,000 acres. In the Settlement of Malacca about 80,000 acres are planted in rubber. There are 32 registered plantation companies in this settlement.

TRADE OPPORTUNITIES IN DUTCH GUIANA.

By Geo. P. Van der Grinten, Resident.

It is now nine months since the European conflict turned the world upside down and scattered want and misery in almost every corner of the civilized world.

Dutch Guiana during this period has had a time unprecedented in her history, and today her position, financially, is practically ruined. Her once flourishing balata industry has ceased to be and the planters are all at their wits end to know how to finance their enterprises. Cocoa, coffee, bananas, rubber and other minor products are overloading the local market, but there is no money to be had for daily necessities, let alone for the purchase of produce to keep pending peace negotiations; and this makes it all the more imperative for the people of Surinam to encourage United States enterprise and United States trade.

Much has been said in the public press recently concerning the possibility of developing our commerce with the United States. It is evident that the United States manufacturers and others can only pay for the goods they import from this colony by selling their own products. Any country is likely to buy most of its goods in the same market in which it sells its products. Any buyer will make better terms with a seller who is willing to take out his credits in trade. The main products of this country are those which the United States use largely, namely, coffee, cocoa, rubber, balata, bananas, gold, timber, tonca beans, oils and gums, bird skins, feathers, etc. With proper cultivation of markets, Dutch Guiana can sell enough of its products in the United States to establish sufficient credit to secure large quantities of American-made goods. Another difficulty—but one which can be overcome—has been the absence of adequate banking facilities. The National City Bank of New York has already established branches in Rio de Janeiro and Buenos Aires, and doubtless others will follow soon. Surinam is in need of such an institution, and would give it a hearty welcome.

The authorities in Holland have communicated with the Government to show consideration to balata concerns and to extend time for paying retribution on balata not yet exported. This has had the result that most of the balata lying around in the bush has been brought into town, and the total production for 1914 has therefore risen to 1,018,818 kilograms. Will the United States dealers make a bid for our staple industry balata? We are certain no reasonable offer will be refused.

The weather at the time of writing is perfect for balata gathering, but it were possible, but, as conditions won't permit, the trees have to remain as ornamental tributes to the past and gather strength in the hope of future operations.

The rubber plantations, or, more correctly, the plantations on which rubber trees grow, are in perfect health and flourishing; very little latex gathering has taken place for the year and the condition of the 7- and 8-year trees could not be better in any part of the world. It is really surprising to see the growth of these trees after an absence of twelve months. The healthy condition of the trees and their marvelous development prove their adaptability to the soil and climate of Dutch Guiana. If the editor of THE INDIA RUBBER WORLD were to see trees in places he visited during his tour of the colony some years back, he would, I am certain, be pleased to recall his remark at the time that the soil of Dutch Guiana was amply suited to rubber growing, and as good as any he had seen in the Far East. That was 10 years ago.

Referring again to the fostering of trade between this colony and the United States, and the credit which this can be accomplished, a colonian to succeed in Surinam must know the customs of the country, and must conform to those customs. The too assertive drummer will not get results in Dutch Guiana, where business is conducted at a slow pace, with much time for delay and along lines which seem to us stilted and old-fashioned. Traveling expenses of representatives are

reasonable, from \$2 to \$5 per day, and that includes almost everything. The handling of foreign orders by firms in the United States is often highly unsatisfactory to customers. Orders are filled by clerks who know nothing of even the geography of the country from which the orders come, and the goods are often packed, consigned and routed in a way which is greatly to the disadvantage of the customer, sometimes even in disregard of explicit instructions as to the method to follow. With increasing community of interest our trade relations with the United States must grow, and there can be no doubt as to the large possibilities of the future.

RUBBER IN DOMINICA.

The Imperial Institute, of London, recently submitted its report to the Curator of the Botanic Gardens, Dominica, on a number of samples of rubber sent from that British West Indian island for exhibition at the rubber show, held in London last summer. This lot included three samples of Pará and one of *Funtumia* rubber. The first two samples of Pará rubber—all of which were supplied in the form of thin biscuits—were described as rather soft and deficient in tenacity, the physical properties of sample No. 3 (smoked) being a little better, but the rubber still rather weak. These three samples are stated to be "very satisfactory in chemical composition, containing from 63.4 to 94.2 per cent. of caoutchouc. In physical properties, however, the rubber is not good, being rather soft and weak, and in this respect specimens are a little inferior to the previous samples of Pará rubber from Dominica examined at the Imperial Institute (see Imperial reports dated February 10, 1909, and February 15, 1912)." The London commercial values placed on this rubber, at prices ruling at the time of making the report, were: No. 1, 2s. 3d. @ 2s. 4d. [54.73 @ 56.76 cents] per pound; No. 2, 2s. 0d. @ 2s. 4d. [48.65 @ 56.76 cents] per pound; No. 3, 2s. 3d. @ 2s. 7d. [54.73 @ 62.84 cents] per pound.

On the sample of *Funtumia* rubber the report reads as follows: "No. 4, Lagos rubber. Thin rough biscuits of light brown rubber, clean and in good condition. The physical properties of the rubber were excellent, and similar rubber would always be readily salable." Its commercial value in London was quoted at about 2s. [48.65 cents] per pound.

The results of examination were as follows:

	Sample No. 1.	Sample No. 2.	Sample No. 3.	Sample No. 4.
Loss on washing, moisture, and impurities, per cent.	0.3	0.2	0.4	1.2
Content of caoutchouc, per cent.	93.5	94.2	93.4	84.6
Residue, per cent.	3.5	3.3	4.4	8.8
Protein, per cent.	2.7	2.2	2.0	6.4
Ash, per cent.	0.3	0.3	0.3	0

By a presidential decree dated November 30 last, Guatemala continued for another six months the suspension of export duty of a cent and a half (American gold) per pound on crude rubber, ordered by decree of May 31, 1914.

The Republic of Nicaragua in 1913 exported 488,169 pounds of rubber, valued at \$278,763, against 338,979 pounds in 1912, valued at \$164,830. Of the 1913 exports the United States took 469,375 pounds, worth \$268,856. This product is gathered in Nicaragua from wild trees in both the eastern and western parts of the country. Its cultivation has been attempted in the western section, but so far without marked success.

Peruvian exports of rubber in 1913 reached a value of \$3,964,856, having fallen off considerably since 1912, when their total value was \$6,357,001.

From January 1 to June 30, 1914, Ecuador exported 45,777 pounds of rubber, valued at \$9,482, as compared with 131,380 pounds, valued at \$67,106, exported during the same period of 1913, a decrease of 85,603 pounds in weight and \$57,621 in value.

- 79,602. J. L. Loefer, Pontre Priet, Cal. Dried seeds. N. Y. Bot. Gard. Herb. No. 11,000. *For. rain-coats.* *For. rain-coats.* *For. rain-coats.*
- 82,278. J. L. Loefer & Robert C. Chong, Pontre Priet, Cal. Dried seeds. N. Y. Bot. Gard. Herb. No. 11,000. *For. rain-coats.* *For. rain-coats.* *For. rain-coats.*
- 83,290. J. L. Loefer & Robert C. Chong, Pontre Priet, Cal. Dried seeds. N. Y. Bot. Gard. Herb. No. 11,000. *For. rain-coats.* *For. rain-coats.* *For. rain-coats.*
- 83,784. H. S. G. White, Atlanta, Ga. Dried seeds. N. Y. Bot. Gard. Herb. No. 11,000. *For. rain-coats.* *For. rain-coats.* *For. rain-coats.*
- 83,800. J. L. Loefer & Robert C. Chong, Pontre Priet, Cal. Dried seeds. N. Y. Bot. Gard. Herb. No. 11,000. *For. rain-coats.* *For. rain-coats.* *For. rain-coats.*
- 84,000. J. L. Loefer & Robert C. Chong, Pontre Priet, Cal. Dried seeds. N. Y. Bot. Gard. Herb. No. 11,000. *For. rain-coats.* *For. rain-coats.* *For. rain-coats.*

ISSUED MARCH 7, 1915.

- 1,129,557. *Process of preserving rubber.* I. D. Jewett, St. Paul, Ind.
- 1,129,576. *Combined rain coat, shelter suit and life-preserver.* P. Waskin, Somerville, N. J.
- 1,129,583. *Life-preserver.* M. P. Wilken, Fort Meyers, Fla.
- 1,129,588. *Life-preserver.* R. E. Collins, Spokane, Wash.
- 1,129,590. *Machine for forming and vulcanizing rubber hose.* S. J. Sill, assignor of one-half to H. H. Hewitt, both of Buffalo, N. Y.
- 1,129,596. *Vehicle wheel tire.* M. Clark, Chicago, Ill.
- 1,129,601. *A girdle foundation comprising an elastic tape.* J. W. Schloss, New York, N. Y., assignor to Castlebone & Co., a corporation of New York.
- 1,129,773. *Solid tire comprising an integrally united series of alternate layers of woven fabric and rubber.* C. A. Hardy, Chicago, Ill.
- 1,129,777. *Life-preserver.* J. B. Kasser and M. Kasser, San Francisco, Cal.
- 1,129,867. *Spring tire.* J. H. Barrett, Paso Robles, Cal.
- 1,129,874. *Reinforcement for pneumatic tires.* A. L. Murray, Auburn, Ind.
- 1,129,880. *Inflating foldable boat.* W. Czarnik, Chicago, Ill.
- 1,129,878. *Rubberized fabric and rubber tire.* M. A. Dees, Lubbock, Texas.
- 1,129,693. *Anti-skid tread for resilient tires.* H. T. Hughes, assignor of one-half to I. Wilkoff and L. S. Wilkoff, all of Youngstown, Ohio.

Trade Marks.

- 83,027. *Rutherford Rubber Co., Rutherford, N. J. Diamond shape design with letter R. For fiber hoof protectors.*
- 83,289. *The Electric Cable Co., New York, N. Y. The word Security. For rubber covered electric wires and cables.*
- 83,403. *Continental Rubber Works, Erie, Pa. The word Vitalic. For hockey pucks, rubber balls, balliard and pool cushions, dolls, life-preservers, foot balls, golf balls and striking-bags.*
- 83,470. *Henry James Collis, Taunton, Mass. The word Corset. For athletic ankle supporters and athletic wristbands.*
- 83,554. *Calvin Price, Chicago, Ill. The word Smile. For chewing gum.*

ISSUED MARCH 9, 1915.

- 1,129,736. *Process of preserving rubber.* I. D. Jewett, St. Paul, Ind.
- 1,129,740. *Spring wheel.* W. E. Keesee, Los Angeles, Cal.
- 1,129,778. *Combined rain coat, shelter suit and life-preserver.* P. Waskin, Somerville, N. J.
- 1,129,795. *Vehicle wheel tire.* M. Clark, Chicago, Ill.
- 1,129,903. *Production of vulcanized synthetic caoutchouc.* F. Hofmann and K. Gottlob, Elberfeld, Germany, assignors to Synthetic Patents Co., Inc., New York, N. Y.
- 1,129,944. *Fountain pen.* W. F. Ullrich, Warren, Pa.
- 1,129,964. *Method of making tires.* M. A. Dees, St. Louis, Mo.
- 1,129,975. *Armored pneumatic tire.* W. R. Morrison, Chicago, Ill.
- 1,129,964. *Hor shoe pad.* F. Kopf, Memphis, Tenn.
- 1,129,977. *Tire cover.* P. Peirce, assignor to R. B. Bailey Co.—both of Los Angeles, Cal.
- 1,129,913. *Life-preserver.* W. Bruce, Manton, Cal.
- 1,129,946. *Slitter and rewinder.* S. M. Langston, Camden, N. J.
- 1,129,973. *Bead-adjusting device.* J. E. Thropp, Trenton, N. J.
- 1,129,927. *Life-preserver.* C. J. Frid, Stege, Cal.
- 1,129,975. *Production of sheeted rubber stock.* C. H. Roper, Belmont, assignor to Hood Rubber Co., Boston—both in Massachusetts.
- 1,129,913. *Resilient tire for vehicles.* C. E. Beard, Columbiana, Ohio.
- 1,129,932. *Tire forming core.* F. Coleman, Akron, Ohio.
- 1,129,949. *Applicator.* A. A. Ellis, Denver, Colo., assignor to The American Tampon and Applicator Co., a corporation of Colorado.
- 1,129,990. *Diving apparatus.* A. B. Drager, Lubbeck, Germany.
- 1,129,990. *Pneumatic tire having a plurality of layers of puncture-proof plates.* C. F. Ferry, Middlebury Center, Pa.
- 1,129,932. *Night shirt having an elastic tire inserted in the neck.* C. W. McClure, Atlanta, Ga.
- 1,129,968. *Golf shoe heel.* S. D. Smith, East Dedham, Mass., assignor of one-half to J. C. Kennedy, Boston, Mass.

Patents.

- 47,083. *Candy-coated chewing gum.* M. M. Swaab, Jr., N. Y., assignor to F. H. Fleer Corporation, Philadelphia, Pa.

Trade Marks.

- 75,124. *Boyers Rubber Works, San Francisco, Cal. Diamond design. For composite rubber packing for pistons.*
- 83,003. *United Dene Co., Boston, Mass. The word Rexall. For atomizers, nipples, operating glasses, bandages, inhalers.*
- 83,748. *The B. F. Goodrich Co., New York, N. Y. Illustration of a dog with the word Huggert. For golf balls.*
- 84,327. *Moller, Hees & Co., Inc., Akron, Pa. The word Mil-exco. For shoe made of rubber, leather or canvas.*

NOTE.—Patents and specifications of United States patents may be obtained from THE INDIA RUBBER WORLD office at 10 cents each, postpaid.]

GREAT BRITAIN AND IRELAND.

PATENT SPECIFICATIONS PUBLISHED.

The number given is that assigned to the Patent at the filing of the application, which in the case of these listed below was in 1913.
*Denotes Patents for American Inventions.

- [ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, FEBRUARY 3, 1915.]
- 22,458 (1913). *Sound excluding ear cap made of Para or other rubber.* J. C. McGowan, 436, Stanley Road, Bootle, Lancashire.
- 22,461 (1913). *Pressing and curing rubber, etc.* H. A. Wickham, Colonial Institute, Northumberland avenue, London.
- 22,494 (1913). *Composition for repairing rubber tires.* W. H. Butlin, 90, Albert street, and J. C. D. Tibbett, 17, Whitby street—both in West Brunswick, Melbourne, Australia.
- 22,518 (1913). *Rubber ring protector against sudden temperature changes, for thermometers.* G. W. Heath and G. A. Heath, Observatory Works, Chalfont, Kent.
- 22,638 (1913). *Apparatus for the recovery of volatile solvents in the manufacture of rubber textures.* A. Boecler, 63, Hallerstrasse, Hamburg, Germany.
- 22,644 (1913). *Substitute for ebomite.* P. P. Damgaard, 81, Nyelandsvej, Frederiksborg, near Copenhagen.
- *22,687 (1913). *Vulcanite lined water tap plug.* C. Wright, Youngwood, Pa., U. S. A.
- 22,704 (1913). *Rubber solvents.* P. Hildebrand, 94, Commercial street, London.
- 22,768 (1913). *Wheel tire.* E. R. Devereux, Second Avenue Chambers, Southampton Row, London.
- 22,810 (1913). *Mold for molding and vulcanizing tires.* J. Schionning, 45, Hejmalsgade, Copenhagen.
- 22,882 (1913). *Wheel tire having loose rubber plugs inserted in holes in the tire and projecting on the outside.* W. T. G. Ellis, 121, St. Vincent street, Glasgow.
- 22,894 (1913). *India rubber packing rings for vulcanizing apparatus.* J. H. Nuttall and R. Bridge, Castleton Ironworks, Castleton, Lancashire.
- 22,931 (1913). *Veil with elastic cord running through the edge.* J. Dumoulin, 17, Rue Royale, Lyon, France.
- 22,947 (1913). *Wheel tire.* C. Thomas, 33, Tyn-y-coed Terrace, Thomas-town, Tynyrefail, South Wales.
- *23,006 (1913). *Wheel tire.* D. A. Yerk North Grove, Ind., U. S. A.
- *23,015 (1913). *Soft rubber bag for dental and other use.* A. R. de Pass, Columbia, S. C., U. S. A.
- 23,021 (1913). *Artificial respiration apparatus.* R. H. Davis, 187, Westminster Bridge Road, London, and L. E. Hill, Osborne House, Loughton, Essex.
- [ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, FEBRUARY 10, 1915.]
- *23,055 (1913). *Vulcanizing press.* J. K. Williams, of Williams Foundry & Machine Co., Akron, Ohio, U. S. A.
- 23,059 (1913). *Wheel tire.* R. W. H. Rodney, Orchard street, St. Augustine's, Bristol.
- 23,087 (1913). *Rubber foot grip for pedal.* R. Surridge, 58, Lomond Grove, Camberwell, London.
- 23,109 (1913). *Artificial respiration.* Drägerwerk, H. & B. Dräger, 53, Molsinger Allee, Lubeck, Germany.
- 23,131 (1913). *Exercising apparatus comprising elastic cords.* A. Abplanalp, 10, Sternengasse, Bale, Switzerland.
- 23,196 (1913). *Sponge substitute.* B. Ottorepitz, 3, Sackstrasse, Graz, Styria, Austria.
- 23,197 (1913). *Waterproof cover for seats.* F. B. Tofield, 109, White Hart Lane, Barnes, London.
- 23,245 (1913). *An appliance for keeping the mouth closed during sleep to prevent snoring.* A. A. Barratt, The Vicarage, Claygate, Surrey.
- *23,396 (1913). *Veil for use in rain or stormy weather, provided with a waterproof section.* A. L. Boher, 118, North La Salle street, Chicago, Ill., U. S. A.
- 23,523 (1913). *Wheel guard for trams comprising a cap of vulcanized rubber.* K. Kriemitz, 18, Magdeburger-strasse, Halberstadt, Germany.
- 23,589 (1913). *Rubber supporting feet for typewriters.* S. V. Hall, 8, Ladywood Road, Liscard, Cheshire.
- 23,634 (1913). *A reversible overcoat, rainproof, or the like having "Raetan" sleeves on the one side, and "set-in" sleeves on the reverse side.* W. Wood and J. Mandleberg & Co., Albion Waterproofing Works, Pendleton, Manchester.
- 23,666 (1913). *Pneumatic tire.* W. Drury, 103, Bridge Road, Hammer-smith, London.
- [ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, FEBRUARY 17, 1915.]
- *23,716 (1913). *Wheel tire.* F. Colby, Box 67, Tuxedo Park, New York, U. S. A.
- *23,748 (1913). *Elastic bands in hosiery.* F. Werm, Swoyerville, Pa., U. S. A.
- *23,749 (1913). *Hose supporter.* D. O'Donnell, 559 West One Hundred and Seventy-first street, New York, U. S. A.
- 25,899 (1913). *Golf practising appliance.* D. Maher, 155, Duke street, Liverpool.
- 23,932 (1913). *Fabric for air craft.* R. Weil, 6, Lortzingstrasse, Hannover, Germany.
- 24,033 (1913). *A kind wheel for aeroplanes consisting of a freely revolvable rim carrying a pneumatic tire.* Soc Anon. Des Aeroplanes, R. Savary, 21, Rue de Bruxelles, Paris.
- 24,071 (1913). *Motor horn with rubber bulb.* W. H. Lenton, 13, Berkeley Road, Earlsdon, Coventry.
- 24,110 (1913). *Collecting india rubber.* H. L. C. Te Mechelen, Mergokarahardjan, Barabari, Java.

- 24,125 (1913). Paint consisting of a metallic powder solution and rubber. British Patent Surbrite Co. and E. G. Meadway, 40, Trinity Square, London.
- 24,184 (1913). Spring wheel with continuous outer rigid ring and pneumatic, hydraulic rubber ring, and like hubs and cushions. J. G. Smith, 14, Sydney street, Stretford, Manchester.
- 24,232 (1913). Wheel tire. E. R. Devereux, 15a, Pembroke Square, London.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, FEBRUARY 24, 1915.]

- 24,277 (1913). Spring wheel with continuous outer rigid ring and pneumatic cushions. A. F. Hawksley, Fairhaven, Lancashire.
- 24,342 (1913). Apparatus for coagulating latex. W. G. ten H. de Lange, 394 A, Marnixstraat, Amsterdam.
- 24,370 (1913). Driving belt. F. T. Swanborough, Oakwood, Melksham, and Avon India Rubber Co., Melksham, Wilts.
- 24,386 (1913). Wheel tire tread bands. F. Waigh, Cookham Rise, Berkshire.
- 24,389 (1913). Air tubes for wheel tires. R. S. Wood, 62, Boston street, Manchester.
- 24,454 (1913). Reservoir pens. H. Stein, 31, Neubaugasse, Vienna.
- *24,480 (1913). Vehicle wheels. J. J. van Iderstine and A. W. White, 512 Chestnut avenue, Kansas City, Mo., U. S. A.
- 24,587 (1913). Mixing and agitating apparatus. B. Goldman, 102, Wilhelmstrasse, Charlottenburg, and Galvanische Metall Papier Fabrik Akt.-Ges., 2, Gerichtstrasse both in Berlin.
- 24,610 (1913). Rotating balloon toy. F. Starck, 7, Smetana Promenade, Pilsen, Bohemia.
- 24,717 (1913). Wheel tire comprising a series of air tube sections, each with a separate valve. B. S. Miles, 3, Ramsdale Crescent, Sherwood, and H. Amphlett-Morris, 114, Nottingham Road, Sherwood Rise—both in Nottingham.
- 24,804 (1913). Roller apparatus for mixing rubber. A. Olier, Usines St. Rémy, Cleimont Ferrand, Puy de Dome, France.
- 24,844 (1913). Veil having an elastic cord in bag-like formation. L. Martin, Paris House, Bridge street, Worcester.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, MARCH 3, 1915.]

- 24,946 (1913). Capsule closures for bottles, comprising layers of rubber or gutta percha. A. Weissenthanner, 76, Avenue de la République, Paris.
- 25,028 (1913). Artificial teeth, having a layer of resilient rubber. R. M. Withycombe, 283, Elizabeth street, Sydney, Australia.
- 25,036 (1913). Extensible lens hood for use with folding cameras, of flexible material, such as silk, rubber, etc. A. L. Adams, Charing Cross Road, London.
- 25,060 (1913). Wheel tire. H. F. Heycock, Otaraia Road, Martinborough, Wellington, New Zealand.
- 25,099 (1913). Rubber sole and heel pads. F. J. Wood, Bank Parade, Burnley, Lancashire.
- 25,111 (1913). Clog sole with rubber plugs. H. Hickson, 79 Charlotte street, Kingston-on-Hull.
- *25,124 (1913). Vehicle wheel with flat rubber tire. L. H. Schoonover, 727 E. Jefferson street, Boise, Idaho, U. S. A.
- 25,131 (1913). Comb manufacturing apparatus. V. P. Schuelmers, 10, Johannesplatz, Crefeld, Germany.
- *25,169 (1913). Pneumatic tire provided with interchangeable outer treads. G. A. Shaw, 528 Third street, Barberton, Ohio, U. S. A.
- 25,181 (1913). Self sealing tire. H. Milligan, 41, Milner Road, Liverpool, and H. S. Hayco, "Beverly," Tarback Road, Huyton, near Liverpool.
- *25,196 (1913). Envelope scaler having corrugated rubber belt, rubber rolls and rubber stripper. F. W. Storck, 14 Whitefield Road, Somerville, Mass., U. S. A.
- 25,351 (1913). Dual pneumatic tire with one or more solid treads vulcanized to fabric, leather, or like flexible bands. N. Rousselle, 212, Chaussée de Ninove, Molenbeek St. Jean, Brussels.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, MARCH 10, 1915.]

- 25,605 (1913). Fabrics for airships, etc. T. Sloper, Southgate, Devizes, Wilts.
- 25,656 (1913). Looped elastic cord to be worn around the neck and adjusted to exert compression and thus prevent sea sickness. E. Stanjer, 28, Ramillies Road, Bedford Park, London.
- *25,674 (1913). Eraser of the kind comprising a holder. B. B. Goldsmith, 19 East Seventy-fourth street, New York, U. S. A.
- 25,694 (1913). Sole and heel protectors consisting of a tread of rubber molded on a backing of wire gauze. I. S. Daniels, 5, Market street, Finsbury, London.
- 25,761 (1913). Vent peg having an inlet valve consisting of a rubber strip. F. Brewster, Station Hotel, Altrincham, Cheshire.
- *25,768 (1913). Vulcanizing india rubber. F. W. Kremer, 32 Central avenue, Carlstadt, N. J., U. S. A.
- *25,769 (1913). Tire tread. F. W. Kremer, 32 Central avenue, Carlstadt, N. J., U. S. A.
- *25,770 (1913). Machine for making rubber tubes for wheel tires. F. W. Kremer, 32 Central avenue, Carlstadt, N. J., U. S. A.
- *25,783 (1913). Rubber rimmed bath tub for invalids. E. A. M. Gallagher, Gouverneur Hospital, Water street, New York, U. S. A.
- 25,830 (1913). Formaldehyde derivatives. F. Pollak, 107, Königgrätzerstrasse, Berlin.
- 25,831 (1913). Spring wheel with solid rubber cushions. S. Hele, "Corona," Alexandra avenue, Rose Park, Adelaide, S. Australia.
- 25,836 (1913). Spring wheel with pneumatic cushions. A. Speight, 61, Arthur Road, Wimbledon Park, and E. W. Meredith, 15, Eastcheap—both in London.

- 25,839 (1913). Pneumatic tire with strips of wire gauze embedded between two layers of plastic rubber. Gafa Tyre Co., 31, Newmarket street, Sipton, and W. C. Platts, Manor House, Kettlewell, both in Yorkshire.
- 25,889 (1913). Rubber covered metal rods interwoven with gut or other strings for rackets. W. M. Short, 1, Woburn Road, Croydon, Surrey.
- 25,926 (1913). Rubber in attaching umbrellas, etc., to vehicles. G. S. Valentin, 18, Charing Cross Road, and C. H. Wakefield, 43, Blenheim Road, Bedford Park, both in London.
- 25,945 (1913). Life saving costume. A. Spilberg, 1, Rue du Commerce, Brussels.
- 25,997 (1913). Repairing rubber articles. W. H. Halsall, 21, Humber street, Longridge, and P. Coulton, 23, Beech street—both in Preston.
- 26,172 (1913). Impregnating fabrics. T. W. Jacobs, 25, Great Tower street, London.
- 26,176 (1913). Pneumatic boot tree comprising a rubber body. L. L. Baral, Petit, 3, Calle O'Donnell, Madrid.
- 26,199 (1913). Coagulating latex. E. J. Byrne, Norwich Union Buildings, St. James' street, London.
- 26,206 (1913). Horse shoe with rubber tread. J. Lilley, 18, Chester Road, Chadley Heath, Staffordshire, and T. Adams, 41, Avenue Road, Black Heath, Birmingham.

THE FRENCH REPUBLIC.

PATENTS ISSUED (with Dates of Application).

- 473,603 (May 27, 1914). Process for manufacturing elastic stock. Wenzel, C. M. b. H.
- 473,657 (October 4, 1913). Elastic tire for bicycles, motorcycles, automobiles and other vehicles. C. Planat.
- 473,663 (October 6). Threads and fabrics of pure asbestos for bandages. E. A. Mollaret and C. A. Bordat.
- 473,703 (October 9). Elastic tire, made of a special felt, for automobiles, velocipedes and other vehicles, and process for manufacturing same. A. Joly.
- 473,713 (June 18). Product to prevent the escape of air from punctured tires. H. G. Taylor.
- 473,787 (October 14). Process for reclaiming rubber. C. E. Anquetil.
- 473,859 (June 22, 1914). Process and apparatus for manufacturing pneumatic tires. F. C. Morton.
- 473,860 (June 22). Process and apparatus for manufacturing casings of pneumatic tires and similar articles. F. C. Morton.
- 473,971 (October 24, 1913). Process for manufacturing rubber. A. Haas.
- 474,012 (October 27). Artificial leather. Société Française de Joints et de Caoutchouc.
- 474,024 (June 5, 1914). Improvement in vehicle wheels. The Dunlop Rubber Co., Limited.
- 474,025 (June 6). Improvements in tires for vehicle wheels and the like. The Dunlop Rubber Co., Limited.
- 474,078 (June 24). Caoutchouc product. Rever Rubber Co.
- 474,079 (June 24). Pneumatic tire. A. E. Guéneau.
- 474,081 (June 24). Mud guard. E. Ressès.
- 474,177 (June 27). System of garters for holding up the shirt. T. Belus.

[NOTE.—Printed copies of specification of French patents can be obtained from R. Bobet, Ingénieur-Conseil, 16 avenue de Villiers, Paris, at 50 cents each, postpaid.]

THE GERMAN EMPIRE.

PATENTS ISSUED (With Dates of Validity).

- 282,301 (July 16). Roller covering with a vulcanized fibre shell. E. Bertram, Düsseldorf.
- 282,347 (March 21, 1913). Process for the manufacture of metallic packing rings for stuffing boxes and the like. F. Deventer, Am Schiffgraben 53, Hanover.
- 282,621 (July 28, 1914). Syringe. J. and H. Lieberg, Kassel.
- 282,622 (May 31). Hypodermic syringe. J. H. Wedig, Granite City, Va., U. S. A.; represented by J. Apitz and F. Reinhold, patent lawyers, Berlin, S. W. 11.
- 282,873 (March 19). Protector for elastic rims. K. Rauch, 41, Königsplatz, Chemnitz.
- 282,897 (November 17, 1912). Plated metallic hose. L. Blumer, Zwickau, i. Sa.
- 282,898 (March 30, 1913). Disc shaped valve of rubber, with a central opening for receiving a bolt. G. Moncorps, Kopernickerstrasse, 11, Friedrichshagen.
- *283,366 (September 1, 1912). A stiffener roller made of rubber for leather working machines. A. H. Kehrhaun, 177, Fürstenbergerstrasse, Luckfurt, a. M.
- 283,407 (January 15, 1911). Hollow rubber tire. Supplement to patent No. 264,863. Max C. Overman, New York, U. S. A.; represented by K. Hallbauer and A. Bohr, patent lawyers, Berlin, S. W. 11.
- 283,437 (January 11). Fabric for the construction of the hulls of airships and process for manufacturing the same. Metzeler & Co., Munich.
- 283,546 (January 20, 1915). Vaginal syringe. F. Niebusch, 2-4, Weiden-damm, and B. Malaika, née Stawik, Ohlau-Ufer, 41, Breslau.
- 283,262 (December 5). Piston packing with one or more flexible packing rings. Siemens and Halske Aktien Gesellschaft, Siemensstadt, 6, Berlin.

THE MARKET FOR CHEMICALS AND COMPOUNDING INGREDIENTS.

THE interesting feature of the present market is the scarcity of the basic oil and tar products. This applies to all kinds of oils, solvents and compounds. Those who use aniline oil as a solvent or when there are a number are bidding as high as \$175 per pound, but the supplies are small and few sales are reported. The present American production is insignificant compared with the extent of the demand.

The European need of trinitro toluol and picric acid explosives has stimulated several enterprises in the production of toluol and toluol, by washing by-product oven gases.

Lead and zinc pigments have shown advances in price during the month. Foreign zinc oxides have advanced on account of shipping difficulties. Earthy fillers of domestic origin are being offered at low figures. Linseed oil has advanced 5 cents a gallon. Perhaps the steadily increasing prices of imported minerals will result in the development of our own deposits of magnesite, mica and graphite.

PRICES OF CHEMICALS AND COMPOUNDING INGREDIENTS. NEW YORK, MARCH 30, 1915.

Acetic acid, 8 per cent, bbls. 48 lbs.	\$6.01 1/4	a	.02
Acetic acid, glacial, 99 1/2 per cent, carboys	107 1/4	a	.08 1/2
Acetic acid, 10 per cent, carboys	21	a	.23
Acetic acid, 10 per cent, carboys	18.00	a	.20 00
Acetic acid, 10 per cent, carboys	1.40	a	1.60
Acetic acid, 10 per cent, carboys	.60	a	
Acetic acid, 10 per cent, carboys	.40	a	.47
Acetic acid, 10 per cent, carboys	1	a	
Acetic acid, 10 per cent, carboys	18.00	a	.20 00
Acetic acid, 10 per cent, carboys	20.00	a	
Acetic acid, 10 per cent, carboys	42.00	a	
Acetic acid, 10 per cent, carboys	18.00	a	.20 00
Acetic acid, 10 per cent, carboys	17.50	a	.20 00
Acetic acid, 10 per cent, carboys	25.00	a	
Benzol, 90 per cent	75	a	
Black oxide	35	a	.60
Black oxide, 10 per cent	63	a	.04
Carbon disulfide, drums of 100 lb.	.06 1/2	a	.07 1/2
Carbon tetrachloride, drums	1	a	.16
Calcium chloride, 70 per cent	.02	a	.04
Calcium chloride, 70 per cent	.04	a	.08
Calcium chloride, 70 per cent	10.80	a	.11 00
Calcium chloride, 70 per cent	14.00	a	.16 00
Calcium chloride, 70 per cent	105	a	.13
Calcium chloride, 70 per cent	15	a	.13
Calcium chloride, 70 per cent	.06	a	.06 1/2
Calcium chloride, 70 per cent	.08	a	
Calcium chloride, 70 per cent	5.00	a	
Calcium chloride, 70 per cent	60.00	a	
Calcium chloride, 70 per cent	37.50	a	.06
Calcium chloride, 70 per cent	20 1/2	a	
Calcium chloride, 70 per cent	.08	a	.1
Calcium chloride, 70 per cent	.30	a	
Calcium chloride, 70 per cent	.06	a	
Calcium chloride, 70 per cent	.01	a	.10
Calcium chloride, 70 per cent	50.00	a	
Calcium chloride, 70 per cent	0.00	a	
Calcium chloride, 70 per cent	.08	a	.1
Calcium chloride, 70 per cent	.08	a	.07
Calcium chloride, 70 per cent	.04	a	
Calcium chloride, 70 per cent	.05	a	
Calcium chloride, 70 per cent	.03	a	.05 1/2
Calcium chloride, 70 per cent	.05	a	.05 1/2
Calcium chloride, 70 per cent	.01	a	.01
Calcium chloride, 70 per cent	.01	a	.01 1/2
Calcium chloride, 70 per cent	.60	a	
Calcium chloride, 70 per cent	.08	a	.05 1/2
Calcium chloride, 70 per cent	.04	a	.04 1/2
Calcium chloride, 70 per cent	.03	a	.04
Calcium chloride, 70 per cent	.04	a	.06 1/2
Calcium chloride, 70 per cent	.05	a	
Calcium chloride, 70 per cent	.08	a	
Calcium chloride, 70 per cent	.04	a	.08
Calcium chloride, 70 per cent	.01 1/2	a	.03 1/2
Calcium chloride, 70 per cent	.06	a	
Calcium chloride, 70 per cent	.24	a	
Calcium chloride, 70 per cent	.26	a	
Calcium chloride, 70 per cent	.07 1/4	a	.08 1/4
Calcium chloride, 70 per cent	.60	a	
Calcium chloride, 70 per cent	.33	a	
Calcium chloride, 70 per cent	.01 1/2	a	.02
Calcium chloride, 70 per cent	.80	a	.87
Calcium chloride, 70 per cent	8.50	a	5.60
Calcium chloride, 70 per cent	.1	a	.60
Calcium chloride, 70 per cent	.06	a	
Calcium chloride, 70 per cent	.07 1/2	a	
Calcium chloride, 70 per cent	.20	a	.23
Calcium chloride, 70 per cent	7.50	a	
Calcium chloride, 70 per cent	.06 1/2	a	
Calcium chloride, 70 per cent	.20	a	2.60
Calcium chloride, 70 per cent	10.00	a	
Calcium chloride, 70 per cent	20.00	a	22.50
Calcium chloride, 70 per cent	5.00	a	
Calcium chloride, 70 per cent	.60	a	

Ultramarine blue	gal	45	a
Vanillin, 100 lb.	lb	.08 1/2	a
Vanillin, 100 lb.	lb	.90	a
Vanillin, 100 lb.	lb	1.10	a
Vanillin, 100 lb.	lb	.3	a
Vanillin, 100 lb.	lb	.41	a
Vanillin, 100 lb.	lb	.10	a
Vanillin, 100 lb.	lb	.25	a
Vanillin, 100 lb.	lb	.30	a
Vanillin, 100 lb.	lb	.04	a
Vanillin, 100 lb.	lb	.650	a
Vanillin, 100 lb.	lb	.40	a
Vanillin, 100 lb.	lb	.70	a
Vanillin, 100 lb.	lb	.75	a
Vanillin, 100 lb.	lb	.05 1/2	a
Vanillin, 100 lb.	lb	.10	a

THE RUBBER SCRAP MARKET.

THE expected improvement in the scrap rubber trade has not been realized, but the good business being done in general rubber manufactured products will eventually be felt by the waste trade. Some dealers prefer to sell on small margins rather than hold out for higher prices. Stocks during the first week of March were really larger than they were at the same time in February. Shoes had quite a drop, selling at 7 1/2 cents, delivered. The mills were buying auto. tires at 4.30a4.35 cents. It is noted that the mills are now specifying the trade name in their orders for white tires—quotations are asked for Goodyear, Goodrich, United States, Firestone and other well-known tires.

The prices on shoes and auto. tires weakened toward the end of the month. Sales of shoes were made at 7 1/8a7 1/4 cents, while auto. tires moved slowly at 4 1/8a4 1/4 cents.

RUBBER SCRAP PRICES PAID BY CONSUMERS FOR CARLOAD LOTS.

New York, March 30, 1915.

	Per Pound.
Boots and shoes	7 1/8 a 7 1/8
Emmelled arctics	5 1/2 a 5 1/2
Auto tires	4 1/4 a 4 1/2
Solid tires	4 1/4 a
No. 1 inner tubes	.23 a
No. 2 inner tubes	.11 1/2 a 12 1/2
Red tubes	.13 a 13 1/2
Bicycle tires	.3 a
Trony tires	14 1/4 a 2 1/4
No. 1 auto peelings	8 1/4 a 9 1/4
Mixed auto peelings	7 a 7 1/2
No. 1 soft white rubber	11 a 12
White winged rubber	9 a
No. 1 red scrap	10 a 11
Mixed red scrap	7 1/4 a 7 1/2
Mixed black scrap	2 1/4 a
Rubber car springs	3 1/4 a
Horse shoe pads	3 a 3 1/4
Mattings and packing	1 1/2 a 3 1/4
Garden hose	5 8/9 a 3 1/2
Air brake hose	3 1/4 a 3 1/2
Cotton tire hoses	13 1/4 a 2

RUBBER COMPANY SHARE QUOTATIONS

The following market quotations of the shares of rubber manufacturing companies on March 29 last are furnished by John Burnham & Co., 31 Nassau street, New York, and 41 South La Salle street, Chicago:

	Bid.	Asked.
Alex. G. & Co. Rubber Co., common	285	...
Alex. G. & Co. Rubber Co., preferred	100	...
Goodrich Tire & Rubber Co., common	368	404
Goodrich Tire & Rubber Co., preferred	110	112
The B. I. G. Tire Co., common	36 1/2	38
The B. I. G. Tire Co., preferred	96 1/4	98 1/2
Goodyear Tire & Rubber Co., common	195	198
Goodyear Tire & Rubber Co., preferred	103 1/2	104 1/2
Kelly-Springfield Tire Co., common	117	118
Kelly-Springfield Tire Co., preferred	83	83
Kelly-Springfield Tire Co., preferred	123	125
Miller Rubber Co., common	165	170
Miller Rubber Co., preferred	101	103
Portage Rubber Co., common	34	36
Portage Rubber Co., preferred	85	95
Rubber Goods Manufacturing Co., preferred	103	107
Sav. Nat. Tire & Rubber Co.	74 1/2	76
United States Rubber Co., common	64	65
United States Rubber Co., preferred	105	106

Review of the Crude Rubber Market.

NEW YORK.

March 30, 1915.

AT the beginning of the month, the indications were that the supply of plantation rubber would be rather restricted. Arrivals from London had fallen off owing to the continuance of the dock strikes at that city; and in addition to this fact, the market was decidedly unsettled owing to the announcement by the British Government of the great extension of its blockade against Germany. Prices were firm, however, first latex crêpe selling at 65 cents, and smoked sheet ribbed at 66 cents spot. Upriver fine was steady at 58½ cents.

The continued delay in shipments and difficulties reported in obtaining London permits during the second week had a tendency to limit trading. The manufacturers were not at all anxious to buy and were not greatly attracted even by the low price of Upriver fine. The knowledge that London stocks were large had a tendency to curtail buying. The resumption of direct shipments from the East to America tended naturally to make the market still less animated.

A general impression prevailed that now there would be plenty of rubber for everybody. This is a mistaken deduction, for these direct boats are only carrying limited quantities. It is reported that the four or five ships now afloat from the East are only carrying between 600 and 800 tons. The "City of Rangoon," now due with 100 tons, is the first direct boat from the East since this service was discontinued. Other direct boats are the "Suveric," from Colombo, now due; the "Kafue" from the same port, due about April 15, and the "Kasama" on the way from Singapore. The "Frankmount," from London, is now due, and the "Saxon Monarch" sailed last Saturday from the same port. The "Sergipe," of the Lloyd Brasileiro Line, left Pará March 24 with 470 tons. The "Stephen," of the Booth Line, is now due from Pará and Manaos with 760 tons.

Heavy receipts marked the closing week of March and prices for round lots are steady: First latex crêpe, 62 cents; smoked sheet ribbed, 66 cents for spot, and Upriver fine, 58 cents.

SHIPMENTS FROM SOUTH AMERICAN PORTS.

Rubber afloat from Brazilian ports exported to Europe is as follows: The Brazilian S. S. "Ceara" sailed from Bahia on March 9 for Genoa, Italy, with 12 tons. The Booth Line S. S. "Anselm" sailed from Manaos on March 10 for Liverpool with 444 tons.

Adelbert H. Alden, Limited, Pará, reports stocks at Pará as 2,872 tons on January 31, with arrivals in February of 5,700 tons, making a total of 8,572 tons. Shipments to the United States were 3,531 tons; to Europe 2,837 tons; leaving a stock of 2,204 tons at Pará on the 28th of February.

THE LONDON MARKET.

The fact that the shipping and dock difficulties in London still continue without any particular probability of their early termination has kept the London market for crude rubber strong during the entire month of March, and that notwithstanding the fact that the London stocks on February 28 amounted to 7,200 tons, as compared with 6,639 tons on the 31st day of January. London prices during the first week of March were as follows: Standard crêpe, 2s. 3¼d.; smoked sheet, 2s. 5d., and hard fine, 2s. 5d. There was a tendency during the early part of the month on the part of the Exports Committee to place some restrictions on the license permits issued, the feeling being that licenses had already been issued for a very considerable tonnage, but it was soon discovered that those who had received the permits had not been able to get all the rubber shipped which the permits called for, and in addition to that fact there were continued substantial arrivals from the East. Consequently permits were again issued very freely.

The increase in freight rates from the East caused by the shortage in carriers, the higher insurance because of war risks and the higher interest charged by the banks, all tended to increase the cost at London of plantation grades.

Prices ruled firm during the month, being a trifle higher at its close than during the opening week. Prices for the last week of March were as follows: Standard crêpe brought 2s. 4d. spot, and smoked sheet 2s. 4½d. Hard fine was steady at 2s. 5½d. Pará sorts have received but comparatively little attention in London on account of the Exchange conditions at Pará and Manaos.

NEW YORK QUOTATIONS.

Following are the quotations at New York one year ago, one month ago, and March 30, the current date:

PARÁ	Apr. 1, '14.	Mar. 1, '15	Mar. 30, '15.
Upriver, fine, new	74a 75	58½a	58a
Upriver, fine, old	60a	59a 60	59a 60
Islands, fine, new	69a 71	50a	53a
Islands, fine, old	.....	.....	.....
Upriver, coarse, new	44a 45	45a 46	46a
Upriver, coarse, old	.....	.....	.....
Islands, coarse, new	31a 32	28a	30½a
Cameta	35½a 36	32½a 33	34a
Caucho, upper	45a 46	46a 48	47½a
Caucho, lower	.....	43a 44	44a

PLANTATION HEVEA

Smoked sheet ribbed	64a 65	65a 66 Spot	65a
		62½a 63 Afloat	62a
First latex crepe	63a 64	62a 63 Spot	62a
		60½a 61 Afloat	61a
Fine sheets and biscuits unsmoked	62a 63	59a 60	.....

CENTRALS.

Corinto	.....	44a 45	46a 47
Esmeralda, sausage	43a 44	44a 45	46a
Guayaquil, strip	.....	.....	.....
Nicaragua, scrap	40a 41	43a 44	43a 44
Mexican, scrap	42a 43	.....	.....
Mexican, slag	.....	.....	.....
Manicoba, scrap	.....	.....	37½a
Mangabeira, sheet	.....	37½a 40	40a
Guayule	.....	.....	.....
Balata, sheet	.....	56a 57	.....
Balata, block	50a 51	45a 46	.....

AFRICAN.

Lepori, ball, prime	53a 54	.....	.....
Massai, red	49a 54	51½a 52½a	52a 54
Soudan Niggers	49a 54	.....	.....
Cameroon, ball	34a	.....	37a 40
Benguela	31a	.....	.....
Madagascar, pinky	.....	.....	.....
Accra, flake	21a 22	23a 24	22½a 23

EAST INDIAN.

Assam	.....	.....	.....
Pontianak	6a 6½	7½a 8	.....

New York.

In regard to the financial situation, Albert B. Beers (broker in crude rubber and commercial paper, No. 68 William street, New York) advises as follows: "The market conditions as regards commercial paper in the rubber line have remained the same during March as in February, the demand continuing good at 4a 4½ per cent. for the best names, and 5a 5½ per cent. for those not so well known; the volume of paper coming into the market has increased somewhat this month."

NEW YORK PRICES FOR FEBRUARY (NEW RUBBER).

	1915.	1914.	1913.
Upriver, fine	\$0.57 a 60	\$.75 a .79	\$0.56 a 1.03
Upriver, coarse	44a 48	46 a 47	42 a 48
Islands, fine	48a 54	64 a 69	92 a 97
Islands, coarse	28a 32	31 a 32	47 a 51
Cameta	30a 36	35 a 38	48 a 51

RUBBER STATISTICS FOR LONDON AND LIVERPOOL, FEBRUARY, 1915.

	Imports	Decls.	1915.	1914.	1913.
Plantations	8,191	8,191	7,173	4,257	2,998
Other lands	89	89	674	549	798
Total	8,280	8,280	7,847	4,806	3,796
Pará	931	487	768	1,003	700
Other lands	106	238	3,333	1,103	1,015
Total	1,121	725	1,091	2,106	1,715
Total London and Liverpool	6,876	6,003	8,940	6,912	5,511

UNITED KINGDOM. CRUDE RUBBER.*

	February.	January and February.
	1913.* 1914.* 1915.	1913.* 1914.* 1915.
IMPORTS FROM		
Dutch East Indies	140	423
French West Africa	34	38
Gold Coast	35	22
Other countries in Africa	35	431
Peru	138	36
Brazil	1,771	1,309
British India	155	373
Straits Settlements and F.M.S.	1,142	5,792
Federated Malay States	694	1,843
Ceylon and Dependencies	585	3,444
Other countries	1,756	227
Total	6,483	12,298
Waste and Reclaimed Rubber	40	87
Gutta Percha (inc. Balat)	357	631
EXPORTS TO		
Russia	563	851
Germany	835	1,661
Belgium	237	532
France	561	1,152
United States	1,427	3,670
Other countries	294	1,481
Total	3,984	8,370
W. R. Grace & Co. Reclaimed Rubber	158	329
U. K. Manufacture	6	14
Foreign and Colonial	30	75
Gutta Percha (inc. Balat)	30	61

* The 1913 and 1914 Ceylon Rubber includes Waste and Reclaimed.

IMPORTS FROM PARA AT NEW YORK.

[Figures in parentheses are in Pounds.]

	Long.	Medium.	Coarse.	Cancho.	Total.
Meyer & Brown	118,800	70,800	199,800	25,700	364,500
Arnold & Zeiss	195,400	7,600	72,100	—	290,100
Robert Badenhop	—	8,700	3,600	—	109,200
General Rubber Co.	60,600	—	—	—	72,900
Robert Badenhop	13,500	2,000	3,000	34,200	61,400
Henderson & Korn	—	—	36,200	7,700	57,200
G. Amsinck & Co.	41,300	4,000	—	—	47,400
Johnstone, Whitworth & Co.	—	—	41,400	—	41,400
H. A. Astlett & Co.	10,700	400	5,800	8,900	25,800
W. R. Grace & Co.	—	2,000	—	—	24,200
Muller, Schall & Co.	—	—	—	8,400	8,400
Total	577,700	90,500	374,700	84,900	1,102,500

CENTRALS.

[Figures in parentheses are in Pounds. with imports of Centrals, denotes Guayule rubber.]

	Pounds.
Pará	3—By the <i>Justin</i> from Pará and Manáos
Isaac Brandon & Bros.	90,000
Adolph Hirsch & Co.	60,000
Adams' Successors, Limited	40,000
March 1—By the <i>Justin</i> from Pará and Manáos	40,000
Adolph Hirsch & Co.	40,000
February 4—By the <i>Justin</i> from Pará and Manáos	1,500
G. Amsinck & Co.	1,500
March 25—By the <i>Justin</i> from Pará and Manáos	3,500
Isaac Brandon & Bros.	4,500
February 6—By the <i>Justin</i> from Pará and Manáos	150,000
Isaac Brandon & Bros.	50,000
G. Amsinck & Co.	300
March 1—By the <i>Justin</i> from Pará and Manáos	1,000
Various	50,000

MARCH 1. By the steamer *Rio de Janeiro* from Pará:

Meyer & Brown	134,300	11,300	43,200	177,600	366,400
G. Amsinck & Co.	66,200	4,500	19,900	31,700	122,300
Arnold & Zeiss	71,700	10,300	25,600	—	107,600
H. A. Astlett & Co.	38,100	9,800	17,800	29,100	94,800
Henderson & Korn	6,700	2,200	37,500	19,300	65,700
Davies, Turner & Co.	9,600	—	22,600	—	32,200
Robinson & Co.	12,300	1,600	15,800	—	29,700
Hagemeyer & Brunn	8,900	—	5,200	—	14,100
Rumsey & Greutert Co., Inc.	11,100	—	—	—	11,100
Total	358,900	39,700	187,600	257,700	843,900

MARCH 2.—By the steamer *Denis* from Pará and Manáos:

Meyer & Brown	213,300	44,700	157,100	55,300	470,400
General Rubber Co.	358,600	27,700	56,700	—	443,000
Arnold & Zeiss	86,800	7,400	40,300	9,700	144,200
Henderson & Korn	74,600	400	12,800	—	87,800
Robinson & Co.	58,700	—	13,000	3,900	75,600
H. A. Astlett & Co.	31,800	9,500	5,700	5,800	72,800
Adams' Successors, Limited	9,000	30,000	31,200	700	70,900
Robert Badenhop	44,900	5,000	6,500	300	56,700
W. R. Grace & Co.	—	—	—	46,800	46,800
Adolph Hirsch & Co.	11,200	2,900	1,200	—	25,300
Davies, Turner & Co.	9,300	—	—	—	9,300
G. Amsinck & Co.	3,200	700	3,500	300	7,700
Total	931,400	128,300	328,000	122,800	1,510,500

MARCH 2.—By the steamer *Denis* from Itacoatiara and Iquitos:

Robinson & Co.	24,900	900	5,300	2,100	33,200
H. A. Astlett & Co.	—	—	9,500	—	9,500
Total	24,900	900	14,800	2,100	42,700

IQUITOS.

Meyer & Brown	27,300	8,500	14,000	93,200	143,000
G. Amsinck & Co.	45,500	12,000	31,400	246,900	335,500
Commercial Bank of Spain	—	—	—	—	—
Adams' Successors, Limited	5,700	—	1,500	173,200	180,400
W. R. Grace & Co.	45,400	4,300	44,000	31,100	144,800
H. C. Kupper	4,800	—	20,500	52,400	115,700
H. A. Astlett & Co.	31,200	3,700	14,100	49,600	98,900
Johnstone, Whitworth & Co.	44,700	3,200	1,200	18,800	78,800
Rumsey & Greutert Co., Inc.	10,500	400	3,600	400	14,900
Total	259,700	32,100	141,300	685,900	1,112,000

MARCH 13.—By the steamer *Minus Gerdes* from Pará:

Meyer & Brown	94,700	12,900	156,000	1,000	264,600
General Rubber Co.	144,600	23,000	10,800	—	178,400
Henderson & Korn	18,500	6,700	82,900	9,200	117,300
Arnold & Zeiss	24,000	8,700	68,700	—	102,300
G. Amsinck & Co.	65,100	—	18,400	—	83,500
Adams' Successors, Limited	—	27,405	20,000	—	47,405
H. A. Astlett & Co.	8,300	3,800	6,100	—	18,200
Muller, Schall & Co.	1,200	—	1,400	5,200	18,800
Total	368,300	82,505	364,300	15,400	830,505

MARCH 15.—By the steamer *Atahualpa* from Pará and Manáos:

Meyer & Brown	107,500	12,600	115,100	110,400	345,600
Arnold & Zeiss	95,700	20,000	107,000	73,700	296,400
Henderson & Korn	10,700	—	116,500	43,100	170,300
G. Amsinck & Co.	70,300	7,300	14,500	—	92,100
H. A. Astlett & Co.	8,900	11,000	31,600	19,000	65,500
Robinson & Co.	52,500	700	3,800	—	57,300
Adams' Successors, Limited	3,700	21,51	32,000	—	57,751
Hagemeyer & Brunn	—	—	—	—	50,600
Davies, Turner & Co.	30,000	—	—	5,700	35,700
Robert Badenhop	25,200	2,700	3,100	—	28,000
Rumsey & Greutert Co., Inc.	21,100	4,500	1,600	—	27,200
Johnstone, Whitworth & Co.	—	—	23,900	4,700	28,600
W. R. Grace & Co.	—	—	—	22,100	22,100
Total	468,500	80,851	449,100	278,700	1,277,151

MARCH 3.—By the *El Valle*—Galveston:

Various = 315,000

MARCH 6. By the *Clara*—Colon:

W. R. Grace & Co.	2,800
Banco Italiano	5,000
Lavacoe Johnson & Co.	2,000
Andean Trading Co.	2,200
Hispano American Sales Co.	3,500
Potthager, Ebeling & Co.	300
M. A. De Leon & Co.	17,300

MARCH 1.—By the *Calumet*—Port Limon:

Isaac Brandon & Bros. = 2,000

MARCH 6. By the *Cipri*—Colon:

S. J. J. Bonemann & Co.	1,000
Meike & Co.	5,500

MARCH 8. By the *Siranda*—Guatemala:

A. Rosenthal & Sons = 1,500

MARCH 8. By the *Minos*—New Orleans:

I. S. Smith & Co. = 10,000

MARCH 1. By the *El Valle*—Galveston:

Various = 45,000

MARCH 12. By the *Clara*—New Orleans:

I. S. Smith & Co. = 6,000

MARCH 15. By the *Atahualpa*—Colon:

G. Amsinck & Co.	1,000
Potthager, Ebeling & Co.	500
Piza, Nephews & Co.	5,000

MARCH 16. By the *Metapan*—Colon:

Isaac Brandon & Bros.	500
W. R. Grace & Co.	600
A. A. Linde & Co.	600

MARCH 16. By the *Hermes*—Montevideo:

G. Amsinck & Co.	5,000
Various	20,000

MARCH 16. By the *Metapan*—Colon:

W. R. Grace & Co.	25,000
Neuss, Hesslein & Co.	11,000

MARCH 18.—By the *Camaguey*—Mexico:

G. Amsinck & Co.	7,000
Hubert & Stack	2,000
American Trading Co.	15,000
W. Lanza & Co.	2,000

MARCH 18. By the *St. Louis*—Liverpool:

Adolph Hirsch & Co.	22,500
---------------------	--------

MARCH 19.—By the *Panama*—Colon:

G. Amsinck & Co.	5,500
Neuss, Hesslein & Co.	2,000
W. R. Grace & Co.	1,700
Santiago Smithers	2,900

MARCH 20. By the <i>Med. Castle</i> —Mexico:	
J. F. Dunbar.....	6,500
Lawrence Johnson & Co.....	3,800
R. del Castillo & Co.....	500
Mexican Hide Co.....	300
H. Manquardt & Co.....	600
	11,400

MARCH 20.—By the <i>El Coricate</i> —Galveston:	
Various.....	56,000

MARCH 20. By the <i>Cristal</i> —Colon:	
G. Amsinck & Co.....	18,300
Lawrence Johnson & Co.....	6,900
Otto Gerdau & Co.....	900
W. R. Grace & Co.....	1,000
J. S. Sembrado & Co.....	800
A. M. Capen's Sons.....	6,900
H. Wold & Co.....	1,900
Pablo Galvet & Co.....	1,900
	39,400

MARCH 22. By the <i>Bela</i> —Puerto Cortez:	
Egeus & Heimlein.....	1,000

MARCH 22.—By the <i>El Valle</i> —Galveston:	
Various.....	*115,000

MARCH 22. By the <i>St. Paul</i> —Liverpool:	
Adolph Hirsch & Co.....	4,000

MARCH 23. By the <i>Fast</i> —Port Lamon:	
Isaac Brandon & Bros.....	500

AFRICANS.

	POUNDS.
MARCH 1. By the <i>New York</i> —Liverpool:	
Rubber Trading Co.....	43,000
MARCH 1.—By the <i>Ile f Mull</i> —Lisbon:	
Various.....	155,000

MARCH 5.—By the <i>Kona</i> —Lisbon:	
Meyer & Brown.....	70,000
Robert Badenhop.....	40,000
G. Amsinck & Co.....	15,000
Various.....	18,500
	143,500

MARCH 13.—By the <i>Andra</i> —Liverpool:	
Rubber Trading Co.....	3,000
Various.....	26,500
	29,500

MARCH 15.—By the <i>Adriatic</i> —Liverpool:	
Rubber Trading Co.....	21,000

MARCH 16. By the <i>Ocean</i> —Liverpool:	
Arnold & Zeiss.....	45,000

MARCH 18. By the <i>St. Louis</i> —Liverpool:	
Ed. Maurer.....	4,500

MARCH 18.—By the <i>Atlantic</i> —Lisbon:	
C. B. Richard & Co.....	112,000
Robert Badenhop.....	138,000
	247,000

MARCH 23. By the <i>Comperio</i> —Lisbon:	
Meyer & Brown.....	38,000
Robert Badenhop.....	80,000
Various.....	32,000
	150,000

EAST INDIAN.

[*Denotes plantation rubber.]

FEBRUARY 27.—By the <i>Baltic</i> —Liverpool:	
Rumsey & Greutert Co., Inc.....	*17,000

MARCH 1. By the <i>Samland</i> —London:	
General Rubber Co.....	*200,000
Henderson & Korn.....	*45,000
Charles T. Wilson & Co., Inc.....	*11,200
L. Littlejohn & Co.....	*45,000
Rumsey & Greutert Co., Inc.....	*22,500
The B. F. Goodrich Co.....	*11,200
William H. Stiles.....	*27,000
Ed. Maurer & Co., Inc.....	*65,000
Various.....	*17,000
	*443,900

MARCH 1.—By the <i>New York</i> —Liverpool:	
General Rubber Co.....	*40,000

MARCH 3. By the <i>Orizaba</i> —Colon:	
Meyer & Brown.....	748,000
Robert Badenhop.....	19,000
Rumsey & Greutert Co., Inc.....	*45,000
Various.....	9,000
	*778,000

MARCH 6. By the <i>St. Stephen</i> —London:	
General Rubber Co.....	*490,000
Aldens' Successors, Ltd.....	18,000
The B. F. Goodrich Co.....	39,000
L. Littlejohn & Co.....	*450,000
Rubber Trading Co.....	24,000
Rumsey & Greutert Co., Inc.....	*22,500
Ed. Maurer & Co., Inc.....	75,000
William H. Stiles.....	*11,000
Robinson & Co.....	4,000
Various.....	30,000
	*778,700

MARCH 9. By the <i>Kokirua</i> —Batavia:	
G. Amsinck & Co.....	*370,000
General Rubber Co.....	*250,000
Manhattan Rubber Mfg. Co.....	33,500
Aldens' Successors, Ltd.....	*27,000
Various.....	18,000
	*578,500

MARCH 15. By the <i>Front</i> —London:	
Meyer & Brown.....	721,000
Henderson & Korn.....	50,000
Johnstone, Whitworth & Co.....	*360,000
Rubber Trading Co.....	67,000
Robert Badenhop.....	70,000
Ed. Maurer.....	185,000
W. H. Stiles.....	56,000
L. Littlejohn & Co.....	70,000
General Rubber Co.....	*480,000
Aldens' Successors, Ltd.....	*13,000
Chas. T. Wilson & Co., Inc.....	71,000
The B. F. Goodrich Co.....	125,000
Arnold & Zeiss.....	75,000
Rubber Trading Co.....	75,000
	*1,721,000

MARCH 16. By the <i>Orizaba</i> —Lisbon:	
The B. F. Goodrich Co.....	10,000
Henderson & Korn.....	12,000
	*12,000

MARCH 16. By the <i>Philadelphia</i> —Liverpool:	
Rumsey & Greutert Co., Inc.....	22,000

MARCH 23. By the <i>Tripea</i> —London:	
Meyer & Brown.....	13,000
Hadden & Co.....	65,000
General Rubber Co.....	50,000
Michelin Tire Co.....	60,000
The B. F. Goodrich Co.....	50,000
Johnstone, Whitworth & Co.....	370,000
Arnold & Zeiss.....	160,000
Henderson & Korn.....	195,000
Goodyear Tire & Rubber Co.....	105,000
L. Littlejohn & Co.....	78,000
Rumsey & Greutert Co., Inc.....	22,500
W. R. Grace & Co.....	33,500
Chas. T. Wilson & Co., Inc.....	12,000
Robert Badenhop.....	75,000
W. H. Stiles.....	30,000
Ed. Maurer.....	112,000
Robinson & Co.....	45,000
Aldens' Successors, Ltd.....	33,500
Rubber Trading Co.....	81,000
Various.....	1,500
	*3,342,000

MARCH 23.—By the <i>Cheltonian</i> —London:	
The B. F. Goodrich Co.....	*380,000
Aldens' Successors, Ltd.....	*270,000
Rubber Trading Co.....	*83,000
Heel Rubber Co.....	80,000
Chas. T. Wilson & Co., Inc.....	*170,000
Robert Badenhop.....	70,000
Rumsey & Greutert Co., Inc.....	33,500
W. H. Stiles.....	11,200
Various.....	67,000
	*1,123,700

MARCH 23.—By the <i>Kanva</i> —London:	
Meyer & Brown.....	76,000
Henderson & Korn.....	56,000
Rubber Trading Co.....	*67,200
	*199,200

MARCH 24. By the <i>Orizaba</i> —London:	
Meyer & Brown.....	700,000
Robert Badenhop & Co.....	40,000
Hadden & Co.....	71,000
Chas. T. Wilson & Co., Inc.....	85,000
Heel Rubber Co.....	85,000
Robert Badenhop.....	70,000
Aldens' Successors, Ltd.....	18,000
Ed. Maurer.....	185,000
W. H. Stiles.....	56,000
Johnstone, Whitworth & Co.....	360,000
Goodyear Tire & Rubber Co.....	105,000
General Rubber Co.....	250,000
Arnold & Zeiss.....	75,000
Henderson & Korn.....	260,000
Rubber Trading Co.....	75,000
	*1,721,000

CUSTOM HOUSE STATISTICS.

PORT OF NEW YORK—JANUARY, 1915.

Imports	Quantity	Value
India rubber.....	67,747	\$2,663,434
Bahia.....	265,566	193,36
Gutta percha.....	146,846	13,802
Gutta printing.....	9,576	50,674

Total.....8,095,665 \$3,231,146

Exports	Quantity	Value
India rubber.....	36,075	\$237,183
Bahia.....	177,836	71,803
Rubber scrap, imported.....	63,000	4,641
Rubber scrap, exported.....	31,968	4,684

PORT OF NEW YORK—FEBRUARY, 1915.

Imports	Quantity	Value
India rubber.....	14,543,805	\$7,000,581
Bahia.....	279,600	64,804
Gutta percha.....	80,000	8,400
Gutta Jelutong (Pontianak).....	1,623,464	75,906

Total.....	16,526,869	\$7,749,691
------------	------------	-------------

Exports.....	506,483	\$17,734
Bahia.....	111,888	8,976
Rubber scrap, exported.....	73,043	9,328

PORT OF BOSTON—FEBRUARY, 1915.

Imports	Quantity	Value
Gutta Jelutong.....	24,800	\$1,388
Gutta percha.....	45,000	5,161

Exports	Quantity	Value
Rubber scrap.....	1,500	40

PORT OF NEWARK—FEBRUARY, 1915.

Imports	Quantity	Value
Rubber scrap.....	18,087	\$1,047

Exports	Quantity	Value
India rubber.....	146,657	\$75,616
Reclaimed rubber.....	188,598	24,998

PORT OF DETROIT—FEBRUARY, 1915.

Exports	Quantity	Value
Rubber reclaimed.....	44,182	\$5,669

PORT OF PHILADELPHIA—FEBRUARY, 1915.

Exports	Quantity	Value
Rubber scrap.....	10,200	\$1,040

PORT OF CLEVELAND—FEBRUARY, 1915.

Imports	Quantity	Value
Crude rubber.....	601,628	\$22,218
Rubber scrap.....	201,628	1,18

PORT OF SAN FRANCISCO—FEBRUARY, 1915.

Imports	Quantity	Value
Crude rubber.....	6,044	\$3,931

PORT OF NEW ORLEANS—FEBRUARY, 1915.

Imports	Quantity	Value
India rubber.....	3,000	\$6,601

EXPORTS OF INDIA RUBBER FROM MANAOS DURING THE MONTH OF FEBRUARY, 1915.

NEW YORK.

EXPORTERS	Fine.	Medium.	Coarse.	Caucho.	Thin.	Fire	Medium.	Coarse.	Caucho.	TOTAL.	GRAND TOTAL.
Suter & Co.....	130,540	13,420	50,599	12,280	206,848	105,777	7,360	6,169	7,754	149,060	355,908
General Rubber Co. of Brazil.....	143,281	30,620	73,398	58,092	305,361	155,766	32,987	2,817	16,044	207,614	512,975
Pralow & Co.....	137,649		73,914	18,043	229,606	107,664	4,106	8,906	60	161,936	390,642
G. Fradelizzi.....	53,062	5,600	35,822	18,676	113,160	126,960	45,215	16,770	9,815	148,767	361,927
Adelbert H. Alden, Ltd.....	5,335	11,241	16,643	312	33,331	88,488	6,248	13,618	12,319	1,007,73	154,204
Tancredo, Porto & Co.....	20,103	3,534	1,575		25,613	39,190	9,383	20,712	2,604	7,888	96,901
J. G. Araujo.....	7,044	650	1,274	151	10,179	35,000	2,560			38,360	68,541
Pinho, Certo & Co.....	14,200	2,753	1,717	2,770	11,140	14,560	1,120	120		7,000	27,140
Semper & Co.....						20,063	2,157	3,817	30	26,137	6,357
G. Deffner & Co.....	18,484				18,484						18,484
Motta & Co.....	10,490	1,273	1,134		13,397						13,397
B. Levy & Co.....						10,160			2,384	12,384	12,384
De Sa & Co.....						1,400		363	24	4,427	4,427
Moraes, Carneiro & Co.....						1,208		1,124	179	3,011	3,011
Serfaty & Bezerra.....						1,760		464		2,224	2,224
Armazens Andresen.....						87		1,217	271	1,575	1,575
Mesquita & Co.....						290			160	1,150	1,150
In transit, Iquitos.....	540,718	69,600	256,376	110,324	977,018	779,535	133,023	97,892	74,079	1,084,529	2,061,547
	120,376	15,268	70,489	326,570	532,703	183,682	10,700	43,408	301,498	834,201	834,201
Total.....	661,094	84,868	326,865	436,894	1,509,721	963,217	143,723	141,290	137,587	1,386,627	2,505,748



Vol. 52.

April 1, 1915.

No. 1.

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TOTAL EXPORTS FROM MALAYA.

(From January to dates named. Reported by Barlow & Co., Singapore. These figures include the production of the Federated Malay States, but not of Ceylon.)

To	Singapore. Feb. 6.	Malacca. Jan. 26.	Penang. Dec. 31.	Port Swettenham. Jan. 27.
Great Britain.....pounds	5,403,977	537,281	19,513,200	3,021,258
Continental.....	638,896	.....	533,333	2,240
Japan.....	9,067	.....	.....	.....
Ceylon.....	23,600	.....	905,333	165,110
United States.....	413,592	.....	960,701	.....
Australia.....	28,080	.....	.....	.....
Total.....	6,517,212	537,281	21,912,567	3,188,608
1914.....	3,456,957	.....	Dec. 31.	Feb. 1.
1913.....	2,413,903	.....	16,042,267	2,594,807
1912.....	973,006	.....	9,684,831	3,141,647
				1,811,248

Plantation Rubber from the Far East.

EXPORTS OF CEYLON GROWN RUBBER.

(From January 1 to February 8, 1914 and 1915. Compiled by the Ceylon Chamber of Commerce.)

To	1914.	1915.
Great Britain.....pounds	1,345,370	2,352,866
Belgium.....	532,862	.....
United States.....	379,243	.....
Germany.....	98,886	.....
Japan.....	56,914	21,656
Russia.....	42,317	74,043
Straits Settlements.....	35,815	.....
Australia.....	13,440	17,101
France.....	5,196	24,640
India.....	500	.....
Canada and Newfoundland.....	.....	122,290
Total.....	2,510,543	2,612,596
(Same period 1913, 1,527,896 pounds; same period 1912, 1,229,506.)		

The export figures of rubber given in the above table for 1914 include the imports re-exported. [These amount to 35,911 pounds.] To arrive at the total quantity of Ceylon rubber exported for that period deduct these imports from the total exports. The figures for 1915 are for Ceylon rubber only.

Singapore.

GUTHRIE & CO., LTD., report [February 9, 1915]:

The Rubber Association auction held today marked a fresh record as regards quantity catalogued, there being 160 tons on offer.

During the course of the forenoon bidding was fairly well maintained and for some parcels of scrap rubber there was spirited competition. In the afternoon demand appeared to fall away to some extent and the earlier values were not maintained.

Smoked sheet was sold at the same level as last week while pale crepe was \$2 better at \$117. Unsmoked sheet touched \$107, an improvement of \$1, while lower grade crepes fully maintained last week's prices. Scraps were wanted, particularly the untreated variety, and substantial advances were recorded.

Seventy tons were sold.

The following was the course of values:

	In Singapore, Picul.*	Sterling equivalent per pound in London.	Equivalent per pound in cents.
Sheet, fine smoked.....	\$114 @ 120	2/ 2 3/4 @ 2/ 3 1/2	52.95 @ 55.75
Sheet, fair to good.....	107 @ 114	2/ 0 3/4 @ 2/ 2 1/8	50.17 @ 52.95
Sheet, unsmoked.....	100 @ 107	1/ 11 1/4 @ 2/ 0 3/4	47.13 @ 50.17
Crepe, fine pale.....	114 @ 117	2/ 2 1/8 @ 2/ 2 7/8	52.95 @ 54.47
Crepe, good, pale.....	108 @ 112	2/ 1 @ 2/ 1 1/4	50.68 @ 52.20
Crepe, fine brown.....	99 @ 113	1/ 11 @ 2/ 2	46.62 @ 52.70
Crepe, good brown.....	80 @ 99	1/ 7 @ 1/ 11	38.51 @ 46.62
Crepe, dark.....	72 @ 95	1/ 5 3/8 @ 1/ 10 1/4	35.22 @ 45.10
Crepe, barky.....	60 @ 91	1/ 2 7/8 @ 1/ 9 3/8	30.15 @ 43.33
Scrap, virgin.....	65 @ 72	1/ 3 7/8 @ 1/ 5 3/8	32.18 @ 35.22
Scrap, untreated tree.....	54 @ 72	1/ 1 1/2 @ 1/ 5 3/8	27.37 @ 35.22

*Picul = 133 1/3 pounds.

Quoted in S. S. dollars = 2 1/4 [56 cents].

RECEIVERSHIP FOR THE PORT OF PARA CO.

Frederick E. Eldridge, of New York, and Alexander MacKenzie, now in Rio de Janeiro, were appointed by the Federal Court, on March 25, receivers for the Port of Para Co., a Maine corporation doing business in Para. The company was incorporated in September, 1906, with a capital stock of \$17,500,000. It secured concessions in Brazil under which it built and has since been managing a system of docks, warehouses and other improvements at Para. The company also owns all the stock of the Amazon River Steam Navigation Co., Limited, a British corporation operating boats on the Amazon River, and one-half of the stock of the Madeira Mamore Railway Co. The exact amount of the company's liabilities is not at present known. It attributes its financial difficulties to the paralyzing effect of the European war on Brazil business.

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Vol. LII. No. 2.

MAY 1, 1915.

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THE INDIA RUBBER PUBLISHING CO.

No. 25 West 45th Street, New York.

CABLE ADDRESS: IRWORLD, NEW YORK.

HENRY C. PEARSON, Editor

Vol. 52.

MAY 1, 1915.

No. 2

SUBSCRIPTIONS: \$3.00 per year, \$1.75 for six months, postpaid, for the United States and dependencies and Mexico. To the Dominion of Canada and all other countries, \$3.50 (on equivalent funds) per year, postpaid.

ADVERTISING: Rates will be made known on application.

REMITTANCES: Should always be made by bank draft or Postoffice or Express money order on New York, payable to THE INDIA RUBBER PUBLISHING COMPANY. Remittances for foreign subscriptions should be sent by International Postal Order, payable as above.

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Entered at the New York postoffice as mail matter of the second class.

TABLE OF CONTENTS ON LAST PAGE OF READING.

A GERMAN CRITICISM OF THE AMERICAN RUBBER TRADE.

THE agreement entered into in January between the British Government and the Rubber Club of America acting in behalf of the American rubber trade, under which the embargo on rubber exports from London was lifted, comes in for some criticism by our German contemporary, the "Gummi-Zeitung." In its issue of March 19 it expresses the following editorial opinion:

"We are surprised that the otherwise liberty-loving Americans have accepted this British control over their independence, and are thus helping their strongest competitor to injure Germany. No one can any longer describe this way of doing business as 'neutral.' This pact with our most bitter enemy makes it clear to us that America not only has but little friendliness in her feelings towards us, but that she actually sanctions the English methods of warfare. In any event this submission to outside control is absolutely unworthy of an independent industry. We feel a sense of shame for the American manufacturers who accept it and even appear to be proud of doing so. The German rubber industry would do well to engrave in its memory the conduct of these American 'colleagues.'"

We are not disposed to quarrel with our contemporary over the expression of its views. It is quite natural that a German paper should look at the matter from a German viewpoint. It would be rather more than human for a writer scanning the horizon from Berlin not to have something of a bias. Nevertheless, in view of this charge that the American manufacturers have submitted to improper dictation, it seems quite in place briefly to recite the facts—which are plain and obvious and which indicate no unfriendliness for any country, nor carry with them any suggestion of sanction of the methods of warfare pursued by any country. The case is a particularly simple one:

England had the rubber and could put whatever conditions on its release she chose; and she naturally determined upon such conditions as would make it impossible for her enemies to profit by its export. England was surely entirely within her rights. In a like situation Germany would have exercised equal caution. Under the circumstances, the conditions imposed were altogether justifiable.

Now, as to the American manufacturers. They needed the rubber which was piled up in London and were willing to comply with any reasonable and proper terms in order to secure it. If they had refused, the embargo would have continued and would have worked great injury to American manufacturers while in no way helping the German manufacturers. The question, in reality, was not one of neutrality at all. The question was simply one of taking the necessary means—as long as no impropriety was involved—for getting the material that was indispensable not only to the continuance of a great American industry but for the general welfare of the American public.

If Germany controlled any product indispensable to any American industry and its export to our shores were possible, American manufacturers would be equally willing to enter into a compact not to permit any part of such product or any article manufactured from it to give aid and succor to the Kaiser's enemies.

A KIND OF THEFT TOO LONG CONDONED.

A BILL was recently passed in Albany which should be the signal for the placing of a similar law on the statute book of every State in the Union, for it prohibits the commercial use by anyone not properly entitled to it of a family or firm name to which someone else has given reputation and value. Certainly every honest merchant

must approve of such a law, and every consumer, regardless of his moral qualities, will profit by its passage.

Probably every industry can show instances of this kind of theft—the stealing of reputation—but in the retail rubber trade this offense has been particularly flagrant. To the general consumer there is no other rubber name that carries so much weight, and therefore is so valuable in retail merchandising, as the name Goodyear; and that is the reason that every unscrupulous fellow who can get hold of a stock of antique, damaged or otherwise inferior raincoats, immediately takes a temporary lease of some empty store, fills his windows with garments marked at prices to catch the unwary and blazons the name Goodyear across the front of the building. The enactment of this law, too long delayed, will effectually stop this dishonorable use of a very honorable name.

THE VALUE OF ADVICE DEPENDS UPON ITS SOURCE.

AN interesting item is floating around the newspaper world which, with the caption, "Oil Your Rubbers," reads as follows:

"Before wearing your rubbers rub them well with vaseline, lard or sweet oil, letting it remain on for a day or two. The greater part will be absorbed by the rubber and the grease will prevent the rubber from breaking."

A man with a sinister cast of mind might possibly suspect that this paragraph emanated from the manufacturers, who, piqued at the shortage of snow during the early part of the winter—when snow counts most—hoped to get a few million people to oil their overshoes and thus help along the desirable work of consumption. But the manufacturers can readily prove their innocence, for, with conspicuous disinterestedness, they are continually warning the purchasers of rubbers against the insidious touch of oil or grease. Practically all the literature distributed by the rubber footwear makers speaks of this very subject. Here is what the 1915 catalogs issued by four different companies, taken at random, have to say on the oil question: "Oil will ruin any rubber," says the first. "Oil will destroy any rubber," reiterates the second. The third amplifies the statement into "Oil or grease will destroy any rubber"; while the fourth declares "Grease of all kinds is injurious to rubber goods and will eventually decompose the rubber."

In view of these statements, which are certainly quite lucid and intelligible, the advice to "oil your rubbers" cannot be laid at the door of the manufacturer. He has

done his full duty. And those who vaseline their sandals and storm slippers, with unhappy results, will have to thresh the matter out with the particular editor who was the cause of their misfortune.

THE GERMAN GOVERNMENT AND RUBBER.

THE report that Germany offers to her chemists an ample reward for the discovery of a practical substitute for the rubber truck tire is interesting. It in the first place argues a definite shortage in both crude and reclaimed rubber. It suggests also that the spring wheels that have of late been adopted are not a success. And last of all it points to the present failure of synthetic rubber. What the Teutonic chemists may be able to produce in the way of "factice" is as yet unknown. Those who know rubber substances will be skeptical, but necessity has mothered many impossible inventions.

Even more remarkable is the offer of the German Government of 100,000 marks for a process for reclaiming rubber. The acid and alkali processes are understood and used by the large German rubber manufacturers. They have also a knowledge of the art of "revivifying" waste rubber. In spite of this they have of late years been large buyers of English, Russian and American reclaimed rubber. Is it possible that this means that, once the war is over, Germany plans to do all of her own reclaiming?

RUBBER'S CONTRIBUTION TO THE SCIENCE OF BURGLARY.

THE rain falls on the just and the unjust alike, and many beneficent conceits of the human mind have been put, unfortunately, to highly improper uses. For instance, modern surgery owes much of its success to the antiseptic conditions under which it may now be performed, and these conditions are possible by reason of the delicate rubber gloves which the surgeon may now wear. But burglary as well as surgery is rather a deft industry and to succeed must be conducted along the lines of modern science. A few nights ago an office in the lower part of New York City was broken into, the safe opened and its contents—amounting to several hundred dollars—carried away. But evidently the operators were hurried in their work, for they left behind them various tools and other insignia of their vocation. The detectives at once began a minute examination for the damning finger prints, but found themselves balked, as there were no finger prints. The burglars evidently believed in germs—at

least in the germ of discovery—and had done their work with their hands carefully covered by surgeons' rubber gloves.

BUSINESS PSYCHOLOGY IN FOR A TROUNCING.

A THOROUGHLY absorbing and highly valuable study is psychology, and it is applicable to many phases of life where mental alertness is a prime factor, but when the psychologists tell us that the foreman of a grinding room cannot properly discharge his duties or a salesman on the road adequately find a market for a gross of raincoats unless they have both steeped themselves in psychological literature, they are going rather too far. They have been much too insistent upon their claims for attention, and the business man, who has so often been told that he can get no proper grasp of his business problems without the assistance of some expert trained in the charts, diagrams and formulæ of the books, will feel a certain sinister joy in the fine trouncing that Professor Boris Sidis, of Boston—one of the greatest of psychologists—administers to his fellow experts who have been so fond of declaring that their particular science was the *sine qua non* of commercial success. Here are a few refreshing excerpts from Professor Sidis' book recently issued, entitled "Foundations of Normal and Abnormal Psychology":

"Any intelligent business man knows infinitely more about business and how to obtain the best results out of certain conditions than all the psychologists with their laboratory experiments, their artificial statistics and puerile, trivial experimental arrangements, giving results no less trivial and meaningless."

He goes on to observe further: "We may as well expect the comparative psychologist to offer practical points on the efficiency of cows to give milk, or on the efficiency of hens to lay eggs. . . . Psychological business claims are illusory. The sooner the practical business man learns this fact the better for him, and also for the earnest psychological investigator."

Of course, no one questions the efficiency of certain psychological tests to meet certain specific conditions—like, for instance, Professor Munsterberg's bi-colored charts to discover the engineer's quickness of eye and rapidity of mental action—but in the great majority of cases the claims of the psychological advocates as applied to business efficiency have certainly been grossly exaggerated, and it is accordingly quite agreeable to hear one of them make this admission in such vigorous fashion.

THE CONSUMER WANTS TO KNOW.

WHEN prices go down the consumer pockets the difference and goes unquestioningly on his way, but when prices go up he always wants to know why. The reason he usually assigns, himself, is the one nearest at hand, namely, that the iniquitous dealer is giving the screw another turn. Generally the dealer is blameless, or at least only partially responsible for advancing prices. Usually the cause is quite remote from the retail store where the public makes its purchases. This being the case, it is always desirable for the retail dealer to point out the true facts to the consumer, so as not to have the burden rest too heavily on his own shoulders.

One would imagine that it should be fairly clear to people in Germany why prices of commodities—including those made of rubber—have advanced during the last eight months. The reasons appear to be patent enough. But, according to reports, the German consumer, exercising the privilege of his class, is complaining very bitterly that he has to pay so much more for articles of rubber than he did formerly. He has made such a protest that a general circular—reproduced on another page—has been prepared for the retail dealers to distribute, calling the attention of the public generally to the fact that when a country is at war and its supplies of materials shut off, its skilled laborers taken from their work and sent to the front, its factories partially or wholly incapacitated—when, in short, all the machinery of manufacture and distribution is quite out of gear and generally dislocated, the upward shoot of commodity prices is a fairly logical consequence and reasonably to be expected.

WHY NOT THE R. C. A.?

THE short cut has always been supposed to make a strong appeal to the American mind. Yet sometimes we go all the way around when we might quite as well make a quick leap across. For instance,—abroad, all the important rubber clubs are almost invariably referred to simply by their initials. When our English friends want to speak of the Rubber Growers' Association or the Rubber Trade Association they don't take the time and space to round these titles out in full, but simply call them the R. G. A. and R. T. A. and let it go at that.

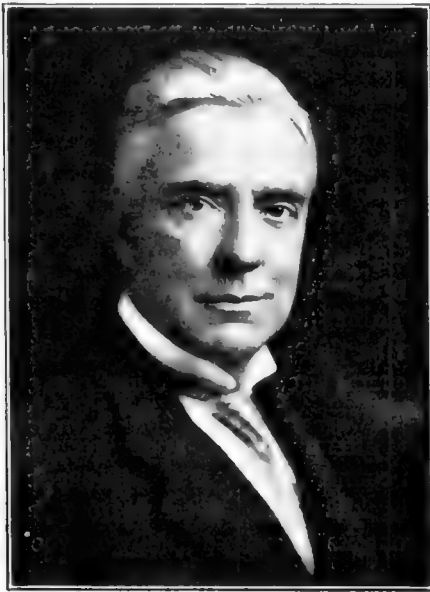
Some American societies have adopted this convenient habit of abbreviation. The Society of Automobile Engineers, for instance, is almost always referred to as the S. A. E., and the National Automobile Association is commonly known as the N. A. A. So why should not the rubber trade follow these excellent precedents and use R. C. A. for the Rubber Club of America and R. T. A. for the Rubber Trade Association of New York?

PRESIDENT HODGMAN OF THE RUBBER CLUB OF AMERICA, INC., is deserving of the thanks of the whole American rubber trade for his work during the past winter. It was due to his initiative, his organizing ability and his untiring effort that the embargo problem was solved. Not only that, but the rearrangement of the Rubber Club in respect to its constitution, its scope and its opportunity for future usefulness is largely the result of his constructive genius.

The Telephone and Its Dependence on Rubber.

THE twenty-fifth day of January last will go down in history as an epoch marking date in the annals of telephony. Upon that occasion Alexander Graham Bell, in New York City, spoke across the breadth of our land with Thomas A. Watson, in San Francisco. Less than 40 years ago those same men were the first to transmit and hear human speech

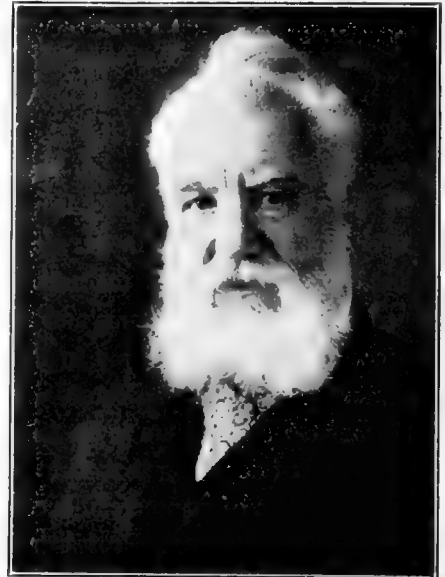
occupied by Watson, Bell ran the wires of his experimental circuit. Finally, on the tenth day of March, 1876, Bell, in his room on the top floor, put his mouth to the transmitter, which he had fashioned for his system, and called, "Mr. Watson, come here, I want you." And Watson made haste to comply, rushing into his associate's room with the excited exclamation, "I heard you; I



THOMAS A. WATSON.



THEODORE N. VAIL.



Copyright by Harris & Ewing.
ALEXANDER G. BELL.

through the medium of wires stretched then over a span shorter than a hundred feet. No wonder Bell, the inventor of this marvelous system of communication, said, as he turned from the transmitter, after hearing Mr. Watson 3,000 miles away, "It's wonderful! Simply wonderful!"

Many of us have still fresh in our memories the commercial advent of the telephone and can recall vividly its early imperfections even when used within a city's limits, and all of adult age know how brief is the interval since the long-distance telephone became a medium of daily service. Therefore, we can understand and appreciate Dr. Bell's exclamations. Many inventive minds and hundreds of trained engineers have lent the best of their skill in the developing of the telephone and its contributive apparatus since Dr. Bell first brought it into being a little less than two-score years ago, but that does not alter a bit the marvel of the telephone's birth.

The second day of June, 1875, will always be a memorable one, for on that occasion an accident brought a revelation to Dr. Bell who at that time, with Mr. Watson, was working away at his so-called "harmonic telegraph" apparatus. It seems one of the transmitter springs of the telegraph instrument in Watson's room stuck, and this bit of magnetized steel produced a current that sent a faint vibration over the electric wire to Bell's receiver something less than a hundred feet away in another chamber. Bell heard that sound, and at once his inventive imagination saw the possibility of the telephone. If the tone of that vibrating spring could be carried over a wire, why not, then, the vibrations of the human voice? To him, the answer was yes, and fulfillment became a question of working out the necessary details.

But the details took many months of labor and patient investigation, and the two young men worked early and late. At the time they were boarding in Boston, and between his room and that

could hear what you said!" Again, it was a matter of details to work out the elements of a commercial system, and how well Dr. Bell succeeded then can be gathered from the fact that it was with his original transmitter, having a vibrating diaphragm of animal membrane, that the inventor talked with Mr. Watson on the 25th of January over the wires reaching from New York to San Francisco.

Thinking the world would be interested in his telephone, Bell decided to exhibit it at the Centennial Exhibition in Philadelphia, in 1876. But so little impressed was the management with the apparatus that Bell's display was poked off in an out-of-the-way corner and generally overlooked by the public hungering for things spectacular—as they understood the term. However, one day along came the Emperor of Brazil, Dom Pedro, who knew of Bell because of the latter's work in acoustics. Bell explained the telephone and persuaded the Emperor to listen at a receiver while he talked. Dom Pedro dropped the instrument, exclaiming: "My God, it speaks!" And the amazement of the distinguished visitor attracted attention to its cause. Bell and his invention were soon the main features of the Centennial.

Just the same, business recognition lagged. But Bell and his few faithful associates stuck to their task, and inside of sixteen months after this patent was issued—that is, by August, 1877—there were 778 telephones in service in Boston. At that time the business was organized under the name of The Bell Telephone Association. And then the inventor substantially turned the task of further development over to others. From that modest beginning has grown the continent-wide system of communication by wire which has revolutionized commercial life here and has brought into intimate vocal touch people physically scattered far and wide.

In the United States, the telephone joins audibly no fewer than

70,000 communities. The plant of the American Telegraph & Telephone Co. and its associated companies alone represents an investment of \$850,000,000. The army of men and women engaged in its operation, exclusive of those employed by connecting companies, numbers 160,000. The messages transmitted over its lines number approximately 9,000,000,000 a year; equivalent to 26,000,000 messages a day, or more than 1,000,000 for each hour throughout the twenty-four. When Dr. Bell sent his message by wire over 3,400 miles of line to Mr. Watson, he utilized only a part of the entire telephone system of this country, which embraces 9,000,000 telephones bound together by an intercommunicable network of 21,000,000 miles of wire.

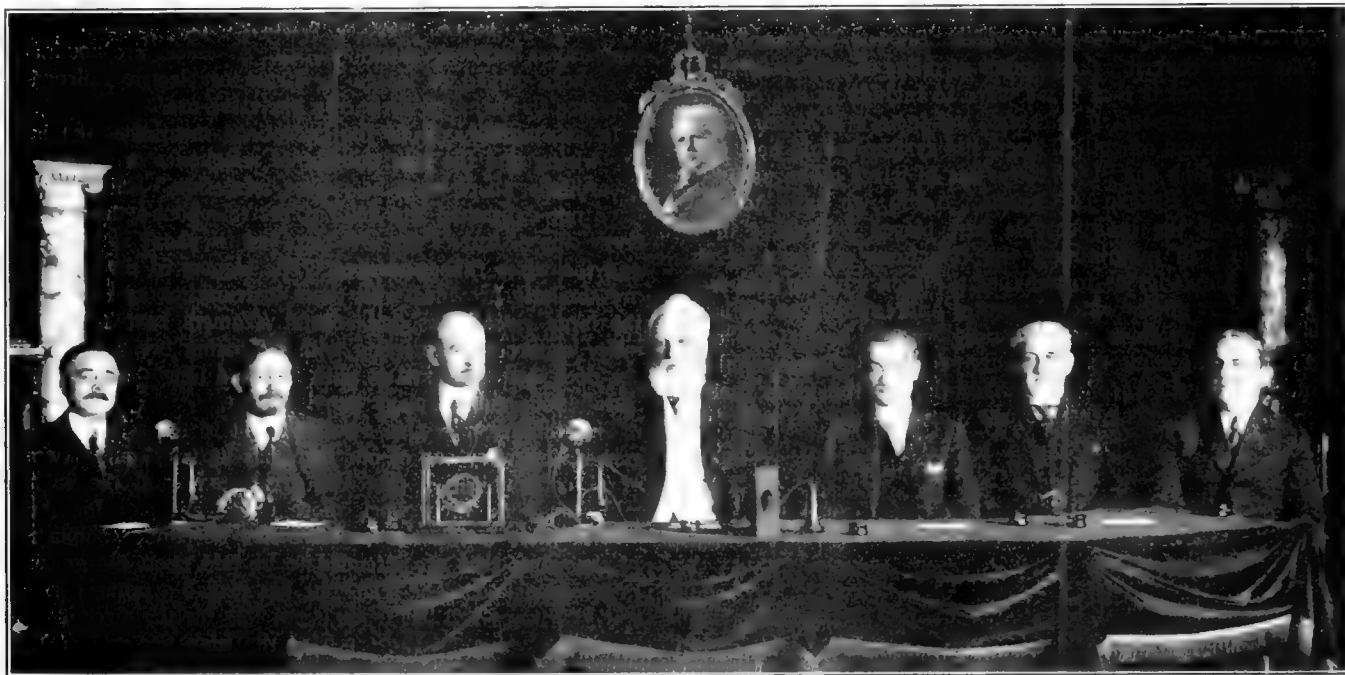
Strange as it may seem, the telephone uses an extremely feeble electrical current, and yet that current must respond sensitively to the sound waves set up by the human voice and ranging all the way from a modest 200 to something more than 2,000 vibrations a second. These minute waves must speed along over the wires without breaking the rhythm of their procession; there must be no jostling or confusion, and each undulation must reach its destination with its characteristic shape, for upon this particular factor hinges the success of intelligible reproduction of the message.

Now the part that rubber plays is that generally of an insulator, a protecting cloak that keeps the feeble current within bounds and prevents it going astray along the metallic path laid out for it. There are critical stages in the travel of each sound-wave where no other medium serves so well to prevent this harmful leakage, despite the fact that the prod of economy has sent the engineers hunting broadcast for a cheaper substitute. The story of rubber's efficiency begins the moment you start to use the telephone. The line is automatically opened by the taking

in coming over the wires. Therefore the receiver must be fashioned of that material which will serve best to guard these vibrations at the moment of their delivery to the auditor. Accordingly, the telephone engineer has found that india rubber will answer for this part of the apparatus more efficiently than any other material.

Speaking from within the home, the hotel, the office, or any other public structure, rubber shields the current from the instrument down through the building until the connection is made with the outside line, be it an overhead or an underground conductor there. A tidy housewife sees to it that the floors and baseboards are duly washed from time to time, and the same sanitary precautions are taken in any well-kept building, therefore there is the danger of moisture reaching the telephone wires, and the fear of dampness is also present when the conductors are run within the walls, as is commonly the case in hotels, skyscrapers and other business edifices. Rubber coatings for all of these wires are necessary to prevent short-circuiting and to lead the electrical currents in the way they should go. Therefore, the intramural leads of every one of these 9,000,000 telephones must be insulated with rubber until they have joined the overhead wires or have effected their junction with the underground cables. The latter, because they are sealed inside of leaden jackets and safe from the reach of moisture, are insulated by means of paper, which answers well enough today. The weakness of the current permits this so long as the covering of lead is there to keep out the dampness.

But, before you get the answering voice from the number called for, india rubber again figures importantly in the line. It is not necessary here to attempt to describe the details of telephone switchboards, but whether the switchboard in question be that of



ALEXANDER G. BELL (CENTER OF GROUP) TALKING IN NEW YORK WITH MR. WATSON IN SAN FRANCISCO. ON HIS RIGHT, U. N. BETHELL, SENIOR VICE-PRESIDENT OF AMERICAN TELEPHONE & TELEGRAPH CO.; ON HIS LEFT, MAYOR MITCHEL, OF NEW YORK.

down of the receiver, and that receiver casing is made of hard rubber. Why? Because that substance has certain physical qualities that make it superior for that employment. Therefore, every time any one of the 9,000,000 instruments in the United States is used a debt of thanks is due to india rubber. Possibly we can be a bit more specific.

The transmitter has the benefit of the vocal waves as they issue from the speaker's mouth with their maximum vigor, while the receiver gets these waves enfeebled by the journey they make

the business office, the hotel, the local district, or central, every time the plugs of the connecting circuit are shoved home the vitally necessary insulation is furnished by rubber. True, the individual amount of rubber in each plug is not great—it isn't large because the stuff is so efficient—but it is indispensable for that service, and many millions of plugs are employed in the multitudinous ramifications of the telephone as it reaches into the public, the private and the domestic walks of life. Again, don't let us forget that there is the toll-line switchboard to be considered

when long distance service is called for, and there are connecting switchboards at the receiving end. Not only does each plug have its insulation of india rubber, but there is an intermediate device called a "jack" which is also fashioned of this same substance, and there are hundreds of thousands of these doing duty.

In addition to the use of rubber in wire insulation, a very large quantity of friction tape is used for splicing telephone wires and making the necessary joints. Probably most people if asked to hazard a guess as to the amount of this tape used for such purpose would name some quite inconsiderable figure, but as a matter of fact the annual consumption of this tape for telephone uses is probably close to 6,000,000 pounds. At least 200,000 pounds of friction tape is made a week, through the year, or, we will say, 10,000,000 pounds for the year; and 60 per cent. of this is used on telephone wires.

Then there are certain accessories that are by no means an unvarying accompaniment to telephone instruments but which are used often enough to make a large aggregate consumption of rubber. For instance, the soft rubber cushion for placing over the hard rubber receiver. A great many people prefer this soft cushion, as it is more agreeable to the ear and, in addition, shuts out outside noises and is particularly desirable for use where the operator's hearing is somewhat defective. And, as a counterpart to this cushion receiver, is the muffler, to be placed over the composition mouth piece, which is also made of soft rubber and fits closely around the mouth. The advantage of this is the fact that one's conversation is not likely to be heard at any distance from the telephone and also that noises around the speaker are not taken into the receiver together with his voice. In fact, in its exclusion of foreign sounds the muffler serves very well as a substitute for the private booth.

It is quite impossible to state in figures the total amount of rubber used in the telephone installations leading to the 9,000,000 instruments now in service. So, too, we cannot give the statistics covering the number of miles of rubber-insulated wires. The fact is that if we were to include in our estimate all of the rubber-coated telephone conductors in hotels, apartment houses and office buildings, the system would be a great deal longer than the 21,000,000 miles of wires given us by the United States Bureau of Census. Again, we have not considered at all the indispensable part played by rubber in installing and in maintaining the telephone systems of this country. Don't let us forget that the men who do this work have to labor under water, in water and exposed to all kinds of inclement weather. Diving suits, rubber boots, and coats and caps of the same materials are required in large numbers. Undoubtedly, the recent consummation of the giant task of opening direct vocal intercourse between the Atlantic and

testing the workers during their strenuous and even hazardous labors, and now it is helping as nothing else can to carry the currents to their far-flung stations in the manner necessary to efficient service.



SPLITTING TELEPHONE POLES AT HUMBOLDT LAKE, NEVADA.

But lest there be any misunderstanding about the figures we have just given in relation to the miles of wire and the number of telephones in this country, the data are from the Bureau of Census and, in the language of the special report, "cover all systems whether operated on a commercial, mutual or coöperative basis, and also all farmer or rural lines. They do not include private lines used exclusively for communication between different rooms or departments of manufacturing or mercantile establishments, hotels, or private residences, unless connected with lines elsewhere through a private or branch exchange. Systems operated by federal, state or municipal governments for communication between different bureaus or offices are not included, nor those owned or leased by steam or electric railroads and operated by them for their own exclusive use."

In substantially all of the exceptions mentioned the bulk of the wiring and the vast number of telephones are indoors and, accordingly, there must be rubber insulation. But even so, we have not exhausted the field of the telephone's usefulness. In every ship of war of the first class the telephone is indispensable and the wires rubber-covered. The biggest of the ocean liners are similarly provided with these instruments, and the latest of the large river boats and coastal steamers have telephones in every stateroom connecting with a floating "central" which, at the dock, can be linked in with the land lines. In these mobile installations rubber plays its vital part.

The military man also owes his debt to the telephone and to rubber, for every one of our forts has its telephone network for vocal communication that the great guns and the submarine mines may do their work more effectively, and for the field service there is likewise an extensive telephone equipment—all of the wires that are intended to be laid upon the ground are rubber-insulated. The telephone has played a prime part in the war in Europe and has made it possible for the directing genius to be safely beyond the reach of the foe's fire and yet in immediate vocal touch with every part of the battle lines. In one case, on a front of only twenty miles, there was run quite a hundred and fifty miles of wire connecting a hundred instruments. This gives us some idea of the extent of this service in view of the stretch of the opposing fronts. For fighting of another sort

fighting with fire—the United States has built, so it is said, fully 3,000 miles of telephone line in the national forests during the past year.

Again, for reasons of safety, most of the important mines in this country are provided with subterranean systems of telephones, and, because of the damp atmosphere through which these reach, rubber-covered wires are uniformly employed where



CARRYING THE TELEPHONE WIRES ACROSS THE WESTERN DESERTS.

Pacific coasts is a national achievement of the utmost significance. In this accomplishment rubber has shared in pro-

the best service is sought. There are no figures available giving the mileage of the wiring, but such installations are growing rapidly in number and expanse. In addition, the rescue helmets contain telephones, and each of these portable equipments is now provided with about 2,000 feet of rubber-insulated wire. Among these personally-conducted telephone outfits might reasonably be numbered the modified dictaphone for the use of the deaf—a telephone in all essentials, but differing from that ordinarily in use by reason of its greater sensitiveness and certain facilities of adjustment. The other form of the dictaphone is that for inter-office communication and for detective work. In all of these rubber has its part to play.

The wires for the transcontinental line have a diameter of .165 inch. The ordinary city circuit that comes into one's office is about one-third this size, insulated with a coating of soft rubber and then covered by an external finish of braiding.

The method of covering telephone wire first with rubber and then with braiding is an interesting one, but there is hardly space here to describe it in detail. In the process of covering telephone receiver cords a cord braiding machine is used which has 32 carriers, arranged in such a way that the heavy portion of the cord is covered with 32 strands. When the required length has been made an automatic switch mechanism at the back of the machine changes the motion so that two tubular braids are formed, each of 16 strands. These 16-strand braids make the forked connection with the receiver.

It may gratify our national vanity to learn what "The Telephone Review" has recently announced. According to that authority, "The telephone has attained its largest measure of usefulness in the land of its birth. It is sufficient to make but one comparison. In the two cities we are joining together telephonically—New York and San Francisco—there are 685,000 telephone stations—more by 50,000 than the number in London, Paris, Berlin, Vienna, Brussels, Amsterdam and Petrograd combined."

SPEAKING TUBES FOR AUTO RACES.

When engaged in a motor car race where the speed is almost or quite two miles a minute it is utterly impossible for the driver and mechanic to communicate with each other. The terrific speed of the car, together with the continual explosions of the engine's cylinders, makes communication between the two



DRIVER AND MECHANIC TALKING THROUGH RUBBER TUBES.

quite impracticable. To obviate this unhappy situation, Mr. E. V. Rickenbacher, who has taken part in a number of these races, has invented helmets to be worn by the driver and the mechanic, which are connected by two rubber tubes, leading

from the mouth of one helmet to the ear of the other. In this way, conversation is possible regardless of outside noise. The front of these helmets, where they fit over the face, is made of flexible rubber so that they will fit snugly but comfortably. The illustration shows the inventor and his mechanic equipped with these speaking helmets.

THE GREAT PROBLEM FOR THE GERMANS TO SOLVE.

CERTAIN branches of the German rubber trade affected by the war have turned their efforts to manufacturing enterprises entirely new to them. In fact, German industry in general has adapted itself rapidly to the unusual conditions created by the war. Soon after the outbreak of hostilities many manufacturers recognized that they would not be able to find enough business in their particular line to engross their activities, so they turned their attention to new lines of manufacture. It was not very difficult for most industries to adapt their plants to new undertakings. Furniture factories took up the manufacture of ammunition cases; metal ware manufacturers made supplies for the artillery; embroidery factories made underwear for the troops; hotel kitchens were turned into meat packing plants, etc., etc.

But for the rubber industry the problem was a harder one. The difficulties were great. The government decree prohibiting the use of rubber for other than military purposes alone was an obstacle impossible to overcome. Many articles could have been manufactured and sold in quantities to the troops in the field, but for the lack of raw material. But German manufacturers feel that there is no reason to despair or to take the attitude that nothing can be done. Moreover, raw materials being scarce, or not to be had, much attention is being given to substitutes. Germans have always been noted for their ability to make use of all available materials.

A writer in the "Gummi-Zeitung" looks upon the present situation as offering extraordinary incentives to the discovery and use of substitutes for rubber, which it is now impossible for German manufacturers to get. He writes as follows: "The rubber industry has before it a great and important problem that must be solved. Substitutes can be used to manufacture certain technical articles, which, on account of the prohibition decree, cannot be made of genuine rubber. Of course it will not be an easy matter to break away from routine, but the task, though difficult, is not impossible. Necessity compels; demands must be satisfied. All should make up their minds to get at the problem immediately. A permanent business can be built up in the substitute line a business that will last even after the terrible war is over. There is a chance for big profits for the firms which enter the field first.

"The field is enormous; the possibilities great. Tent materials, knapsacks, bread sacks, parts of uniforms, helmets, helmet parts, canteens, eating utensils, all sorts of technical articles and fixtures are now in great demand and will continue to be in demand after the war is over. The layman cannot realize how immense the possibilities are. Great things can be done, but we must cut away from routine and not be afraid to take up problems and methods entirely new to us. Every merchant should show interest in articles made of rubber substitutes. There is a great future for them, even after the war is over. Capitalists should remember their former ventures in crude rubber; they should not hesitate to finance good substitute enterprises. We must all apply ourselves to the problem and solve it. The possibilities certainly justify the efforts."

Soft rubber goods to the amount of 2,052,249 pounds were imported into Sweden in 1914, against 2,137,212 pounds in 1913.

What the Rubber Chemists Are Doing.

A NEW VULCANIZATION THEORY.

AN anonymous contributor signing himself "Rubber" in "Le Caoutchouc & la Gutta Percha" of March 15, thinks that vulcanization depends on the colloidal state of rubber. He does not think Ostwald's absorption theory well founded, but thinks Weber's combination theory better.

Sulphur has seven or eight states, but the colloidal state is the only one adapted for vulcanization, and S_8 is the key to vulcanization. Pure gum and sulphur will not vulcanize in proof of which Stevens and Weber are cited—but with resins and proteins present the conditions are favorable. Stevens concluded that both resins and proteins had a role but did not determine it.

If rubber and resin are heated together, hydrogen-sulphide is generated, as is shown by the fact that paraffine and sulphur produce hydrogen-sulphide. The insoluble matter in the rubber oxidizes sulphur to SO_2 —for example, free sulphur and litharge heated in air, or an airy body as light magnesia, generate SO_2 . The role of the resins, insoluble oxides and adjusters is to form hydrogen-sulphide and free sulphur. Various bodies transfer S_8 to sulphur with formation of hydrogen-sulphide and SO_2 . Late experiments on rubber show SO_2 diffused through gum. Sulphurous-acid and hydrogen-sulphide will react to form water and sulphur. The role of the earthy bodies is to absorb water.

The transformation of S_8 into sulphur requires distribution of certain methylene groups; instead of having all of di-methyloctadiene there is some octadiene. This reduces it from isoprene caoutchouc to butadiene. Heating in the open shows hydrogen-sulphide, which proves decomposition of methylene. As the heat of formation of hydrogen-sulphide is greater than vulcanization, there is formation of free hydrogen-sulphide, which is occluded, as can be determined by the acetone extract reaction. The hydrogen-sulphide from the decomposition of methylene carries the combined sulphur of the rubber. The above vulcanization theory presents many novel points and probably will not be accepted without considerable discussion.

AN ENGLISH VIEW OF CHEMICAL ANALYSIS.

The "India Rubber Journal" of March 6, in an editorial, criticizes adversely the practice of giving the chemical analysis of rubber. The opinion is expressed that this is no criterion either of its market value or its behavior. It is suggested that the washing loss and usual physical attributes be stated. If the technologists cannot agree what physical requirements are desired, they think the sooner that it is admitted the better. They believe the chemical analysis should give the breaking strain, etc. In this country a realization of the value of chemistry in the rubber business is now shown by the general employment of chemists in all the prominent rubber works. A force of 40 chemists is kept by one large company in a laboratory distinct from any works, employed only on research work.

While it is true that we know so little yet about the chemistry of rubber that we cannot always determine by analysis the value of the sample, yet it is realized that many useful things can be so determined. It is quite possible to determine by analysis the probable shrinkage, as this consists of water and dirt. Both of these can be determined by analysis, but the washing does not always take out all the dirt, so that the analysis may not agree with the washing. The analysis is perfect but the washing is not. The resin can also be determined with accuracy and its nature shown. It is generally admitted that a large quantity of resin is harmful to the rubber as such, although its qualities may be desired for some work or purpose. The rubber itself may also be determined as to amount but not so accurately as to quality. Of late, however, it has been shown that small

quantities of the insoluble colloids found in some samples greatly affect its quality—usually favorably. All this shows progress and indicates that eventually we will be able to determine the value of rubber by analysis when we know more about rubber chemistry.

SOME SYNTHETIC PATENTS.

Matthews and Strange received British patent No. 24,790 in 1910 for the treatment of synthetic caoutchouc with liquid SO_2 . This we have noted before, but patent No. 2,070, of 1914, has been issued to them for a modification of the same process and has seemed to attract considerable attention, as it has been noted in many of our contemporaries.

Fritz Hoffman has assigned to the Synthetic Patents Co.—which holds the American patents of the Beyer company, of Elberfeld—a patent on treating certain synthetic rubbers with piperidine or its homologues, and then vulcanizing with sulphur as usual.

EXPERIMENTS.

W. H. Caspari has contributed an article—published in the "Journal of the Chemical Society" (England), for February, 1915, page 162—which relates a number of experiments in precipitating rubber by alcohol or acetone from solution in benzol. The experiments showed that one gram of caoutchouc when dissolved in 40 c.c. of benzol precipitated when 15 c.c. of alcohol was added, forming 148 grams of precipitation. At higher temperature, the necessary proportion of alcohol rises. Any little moisture present produces precipitation much quicker. In 43 vols. alcohol to 100 of benzine at 20 degrees C. caoutchouc was practically insoluble. In 80 vols. acetone to 100 of benzine at 20 degrees C. caoutchouc was practically insoluble.

DECISION ON RECLAIMING PATENTS.

An important decision has been rendered by Judge Clark in the federal court in Cleveland, Ohio, in a suit brought by the Philadelphia Rubber Works Co. against the Portage Rubber Co. for infringement of the Marks patent No. 635,141.

It appears that in 1900 Arthur H. Marks assigned his patents on reclaiming, which comprise what is usually known as the "Alkali Process," to the Diamond Rubber Co. The Diamond in turn assigned to the Alkali Rubber Co., reserving the right of action and any awards in the suit against the Calumet Tire & Rubber Co. then pending. The Alkali Rubber Co. assigned to the Philadelphia Rubber Works Co. in 1911.

The Portage Rubber Co. alleged first that the Marks patent was invalid and secondly that it did not infringe, as it used the Wildman and Christy process—patent No. 993,485. The decision sustained the contentions of the Portage company on both counts.

Viewing patent No. 249,970 granted to N. Chapman Mitchell, of Philadelphia, the judge decided that it was an anticipation of the patent in suit. Of course, this is the court of first instance and an appeal will probably be taken.

THE PERMEABILITY OF RUBBER TO CARBONIC ACID.

In the "Chemiker Zeitung," 1914, page 1249, V. Rodt discusses the diffusion of carbonic acid through rubber. He finds that a pure vulcanized rubber tube filled with the gas will collapse if kept in the air for from 12 to 24 hours and this collapsing is greatly hastened if the tube is immersed in water.

But if the gas inside and the air outside are perfectly dry there is no collapse in one month's time. Carbonic acid is not absorbed by rubber. With water and carbonic acid in contact with rubber only 6.3 per cent. was absorbed in 25 days, and the water amounted to 6.12 per cent. so that only eighteen hundredths of one per cent. of carbonic acid was absorbed. The rapid diffusion

of gas through a rubber septum is due to the high solubility of the gas in water and the "hygroscopic" nature of rubber.

These findings do not agree with those of F. Steinitzer and P. Phillips as reported in THE INDIA RUBBER WORLD of March, 1915, page 323. The latter authors found that rubber did absorb carbonic acid and seemed to have proved it satisfactorily.

F. Frank and E. Marckwald in a report in "Kautchuk Zentralstelle" of April, 1914, assert that the nitrogenous portion of rubber is a true protein, giving many reactions in proof of this. In THE INDIA RUBBER WORLD of October, 1914, page 18, Spence and Kratz are reported to have found that the nitrogenous portions of rubber were of the nature of gluco-proteids.

DETERMINATION OF SULPHUR.

In the "Analyst," 1915, page 11, Gaunt describes a method of determining sulphur in rubber by means of a combustion tube, in which a sample—0.2 gr. to 0.3 gr.—is placed. The tube is drawn out and connected with absorption flasks containing H_2O_2 . Dry oxygen is run through while heating the tube and the $S.O_2$ produced is absorbed by the H_2O_2 .

If the rubber contains fillers, determine the sulphur in those also separately. The determination is said to be made in 90 minutes and agrees with the Carus method.

POLYMERIZED OILS FOR FACTICE.

R. S. Morrel, in the "Journal of the Society of Chemical Industry" for February, 1915, page 105, gives results of a study of the polymerization and thickening of a number of oils, such as tung oil—or, as called here, China wood oil—linseed, poppy oil and others. These oils can all be thickened into plastic masses. China wood oil appears to be the best.

RECENT CHEMICAL PATENTS.

W. H. Perkins and F. E. Matthews have received British patent No. 15,049 of 1913, for converting butadiene and homologues into rubber by the use of oxidizing agents.

The Hood Rubber Co. has been assigned United States patent No. 1,106,290, which claims the process of passing the vapor of iso-propyl-ketone over heated aluminum silicate at a temperature of between 400 and 600 degrees centigrade.

Fritz Hoffman and Kurt Gottlob, of Elberfeld, Germany, have received United States patent No. 1,130,903, which seems to claim the use of piperidine or methylene base in vulcanizing synthetic caoutchouc.

Isoprene compound with $S.O_2$ is described in "Chemical Abstracts," 1915, page 623.

M. L. Bouchet in "Comptes Rendus," 1915, page 240, has attempted to measure the expansion or deformation of vulcanized caoutchouc under the influence of an electrostatic field. Fontaine, in 1831, found that a Leyden Jar expands during the charge.

MORE ABOUT RUBBER FOAM.

Professor Perrot, a French chemist, has been devoting himself to the study of rubber foam, that curious discovery which was described in the January issue of THE INDIA RUBBER WORLD.

Rubber foam, or *caoutchouc mousse*, as it is sometimes termed, was heralded principally as a substitute for air tubes in automobile tires, but Professor Perrot has been studying it from another point of view and claims to have discovered that it is superior to any known heat insulation. The best heat insulation now used is cork pulverized and agglomerated with casein, but where a cubic yard of this weighs close to 300 pounds, the same quantity of rubber foam only weighs about 116 pounds, and its thermic conductivity is much lower than that of the cork insulation. Further, the cork compound is subject to rapid putrefaction, against which it is difficult, in fact impossible, to protect it.

In addition to its applicability to automobile tire construction, it is stated that rubber foam can be used in making life-saving mattresses for marine use, air tight compartments for life boats,

linings for telephone booths, noiseless and resilient carpets and insulation for refrigerators and refrigerating machinery.

RUBBER STATISTICS FOR THE UNITED STATES.

IMPORTS OF RUBBER AND MANUFACTURES OF.

ARTICLES.	February, 1915.		Eight Months Ending February, 1915.	
	Quantity.	Value.	Quantity.	Value.
India rubber, etc., and substitutes for, and manufactures of:				
Unmanufactured				
Balata pounds, free	209,629	\$64,804	1,938,142	\$763,200
Guayule gum	713,040	201,760	2,844,734	828,544
Gutta jelutong	1,928,264	87,864	10,219,462	483,447
Gutta percha	125,351	13,583	972,061	142,479
India rubber	15,477,653	7,593,737	90,481,060	42,285,467
India rubber scrap or refuse, fit only for remanufacture	441,989	38,710	7,289,277	487,761
Total unmanufactured.		\$8,000,458		\$44,990,898
Manufactures of—				
Gutta percha dutiable		\$106		\$10,293
India rubber "		57,630		610,464
Total manufactures of.		\$57,736		\$620,757
Substitutes, elasticon and similar dutiable		\$2,056		\$24,559

IMPORTS OF CRUDE RUBBER BY COUNTRIES.

From:				
Belgium pounds			1,902,370	\$950,872
France	33,675	\$17,067	612,889	257,033
Germany			732,118	358,088
Portugal			1,798,119	538,996
United Kingdom	10,581,465	5,345,432	35,849,563	18,329,034
Central American States and British Honduras	67,782	35,051	389,607	168,540
Mexico	43,455	19,225	1,284,872	487,497
Brazil	3,483,244	1,411,623	30,175,069	12,406,174
Other South America	343,127	173,039	2,465,507	1,095,371
East Indies	26,420	11,816	12,746,417	6,147,760
Other countries	898,485	580,484	2,524,529	1,546,102
Total	15,477,653	\$7,593,737	90,481,060	\$42,285,467

EXPORTS OF AMERICAN RUBBER GOODS.

India rubber, manufactures of:				
Scrap and old pounds	123,787	\$12,608	1,352,641	\$139,807
Reclaimed	524,095	65,039	3,904,007	528,440
Beltting, hose and packing		144,777		1,240,296
Boots and shoes—				
Boots pairs	42,818	97,026	298,011	671,358
Shoes	130,443	85,281	1,773,396	1,838,999
Tires				
For automobiles		351,546		2,260,103
All other		24,769		248,277
All other manufactures of		276,749		1,869,859
Total		\$1,057,795		\$8,797,139

EXPORTS OF AUTOMOBILE TIRES BY COUNTRIES.

Tires for automobiles:				
France				\$6,090
England		\$189,481		1,081,141
Canada		56,326		414,392
Mexico		4,161		65,017
Philippine Islands		32,086		157,247
Other countries		69,492		536,216
Total		\$351,546		\$2,260,103

EXPORTS OF FOREIGN MERCHANDISE.

India rubber, etc., and substitutes for, and manufactures of:				
Unmanufactured				
Balata pounds, free	111,580	\$33,676	769,755	\$300,139
Guayule gum				
Gutta jelutong				
Gutta percha			3,460	1,488
India rubber	749,195	337,061	4,847,570	2,590,040
India rubber scrap or refuse, fit only for remanufacture				
Total unmanufactured.		\$37,727		\$2,891,667
Manufactures of India rubber dutiable		\$33		\$5,442

The Cole Course Protractor is the name of a recent invention, which, in connection with a map or chart, enables the navigator to quickly and accurately map out a safe course. This instrument is made of polished brass, a circle of rubber being attached to the under side of the base to prevent slipping on the chart. [Marine Compass Co., Bryantville, Massachusetts.]

New Devices for Rubber Testing.

By A. F. Shore.

VULCANIZED rubber is divided into two general classes that bear the trade names, hard rubber, or vulcanite, and soft rubber. Under the last-named class is grouped an infinite variety of goods that vary greatly in hardness and in elasticity. Many instruments have been designed to measure their physical properties.

Difficulty is, of course, experienced in this because of wide variation in structure and in chemical composition as well as frequent exaggeration of one property at the expense of the other. The factors thus concerned are what might be termed fibrous as opposed to non-fibrous formations, extreme brittleness, elasticity or plasticity. The range is so wide that it is difficult to make a single instrument which in its range of sensitiveness would cover it entirely.

Crude rubber shows unexampled elasticity, but little hardness; hard rubber, any degree of hardness up to glass brittleness or any degree of elasticity down to that common to other brittle hard bodies.

It thus follows that an instrument suitable for measuring the hardness of soft rubber, will be useless for brittle hard rubber; also, one that will determine elasticity of such soft rubber will be useless on the more brittle hard rubber. To successfully measure the properties named, the Elastometer for elasticity, and the Durometer for hardness, have been devised by the Shore Instrument & Manufacturing Co.

The Durometer when applied to soft rubber indicates its resistance to the penetrating force of a blunt pin. This pin projects from the instrument three thirty-seconds of an inch and is held by a carefully calibrated spring. On the harder grades it is pushed in most of its length against the tension of the spring. The extent of the compression, and, conversely, the deformation of the rubber, are indicated on the dial, expressing units of hardness. The size and position of these units, since the value 50 is the average hardness for soft rubber, have been carefully chosen and obviously will remain constant in the future.

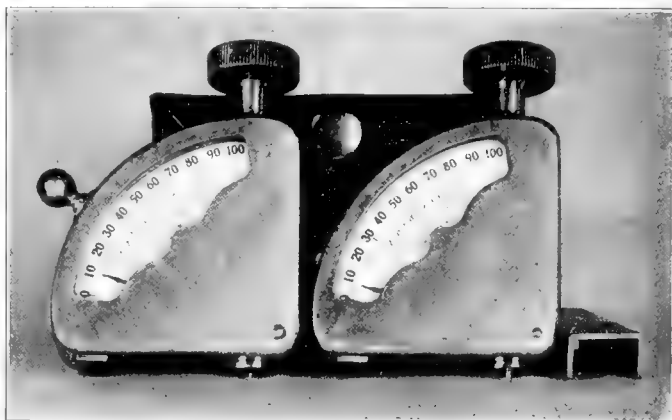
With the Durometer is provided a standardized spring balance upon which the hardness it represents is marked and with which it is checked up from time to time, as is customary with all accurate testing instruments. The hardness of crude rubber varies all the way from 25-30, on the scale adopted, to 75-80 after vulcanizing. When a hardness of 70 is exceeded, there is obviously a rapid drop of elasticity, but an increase in strength or resistance to stretching, so that it is safe to say 70 is ordinarily the limit of hardness where the service value of the rubber depends equally upon the accompanying elasticity.

Where rubber cushions have to withstand the greatest possible load, as in solid tires, the highest hardness is called for, with the necessary quota of elasticity. Where the rubber itself is not depended upon for sustaining loads, as in pneumatic tires, the rubber used is given a more moderate hardness, with due compensation by greater elasticity. The hardness measure thus may give information as to the suitability of vulcanized rubber for various purposes. This means that in the cheapest solid tires, for example, the desired hardness will be shown, but there would be a lack of elasticity, and such a tire would fail to give the desired cushion effect and soon wear out.

Rubber may be said to have a total value. This would be the figures representing hardness and the elasticity multiplied together. As an example, a solid tire showing a hardness of 70 units and an elasticity of 55 per cent., would have a total value of 70 times 55, or 3,850, which would be considered a high figure. Another solid tire, having a hardness of 70, but an

elasticity of only 30 per cent., would show a total value of 70 times 30, or 2,100.

In general practice, however, it would not be proper to refer indiscriminately to rubber as having a total value, for a given product may be obtained in widely different ways, as for example, one rubber is 50 hard and has an elasticity of 70, while another is 70 hard and has 50 per cent. elasticity. The product in each case is the same, but the rubber is adapted for widely different purposes. The former will be better for pneumatic tires, and



THE SHORE ELASTOMETER.

THE SHORE DUROMETER.

the latter for solid tires. When hardness and elasticity measurements are made to ascertain the total value of the rubber, it is necessary to state the specific degree of hardness, and also the percentage of elasticity.

Elasticity is more difficult to measure than hardness, because its manifestations are not the same under different methods of testing.

The simplest though not the most convenient way of testing the elasticity is by stretching a band of uniform thickness. Another way is to drop a ball on a sample of rubber from a certain height and note the rebound. The rebound values will not agree perfectly with the stretch values, for conditions enter the rebound test, in regard to time and distance penetrated, which would not enter in a stretch test.

In testing the elasticity of rubber with an instrument that is to be applied to the surface without damage, the stretch test is most closely imitated by one involving a tearing or cutting stress. Rubber having 100 per cent. elasticity will resist the penetration of a knife or a sharp point for a given depth without cutting in the slightest degree. Should, however, the elasticity be somewhat imperfect, the cutting will take place to the extent that the elasticity is deficient, until at last the elasticity is so low at a given hardness that cutting will occur almost the entire distance penetrated. Cutting, after all, in the absence of a saw action, consists of imposing a stress on the fibers in contact with the edge, which will more readily be overcome as the rubber fails to elongate or stretch away from it. The Elastometer has been devised by applying this principle. The action is as follows: A medium sharp pin, three thirty-seconds of an inch long, is locked and caused to penetrate its entire length into the rubber. After a few seconds the pin is unlocked and allowed to be pushed back by the rubber, according to its power to recover its original form or its elasticity. The pin actuates a very delicately balanced indicating needle, reading in percentages of elasticity. If it is

pushed back only half way, 50 per cent. is shown; if it is pushed back all the way, as when the rubber suffers no injury at all, 100 per cent. elasticity is shown. The depth the pin is required to penetrate and the sharpness of its point have been determined by experiments. The most elastic rubber, according to the stretch test, just barely escapes cutting.

Soft rubber will lose about 14 per cent. of its hardness when the temperature is raised from 32 to 212 degrees. Such heating does not materially decrease the total value of the rubber in so far as its stress and deformation resisting properties go. This is explained by the fact that there is an increase of elasticity at about the same rate as there is a decrease in hardness. The only danger that would appear to exist is where the rubber is exposed to friction with other rubber. The heat increases the cementing affinity and causes rapid wear. Solid tires having the right proportion of hardness and elasticity at normal at-

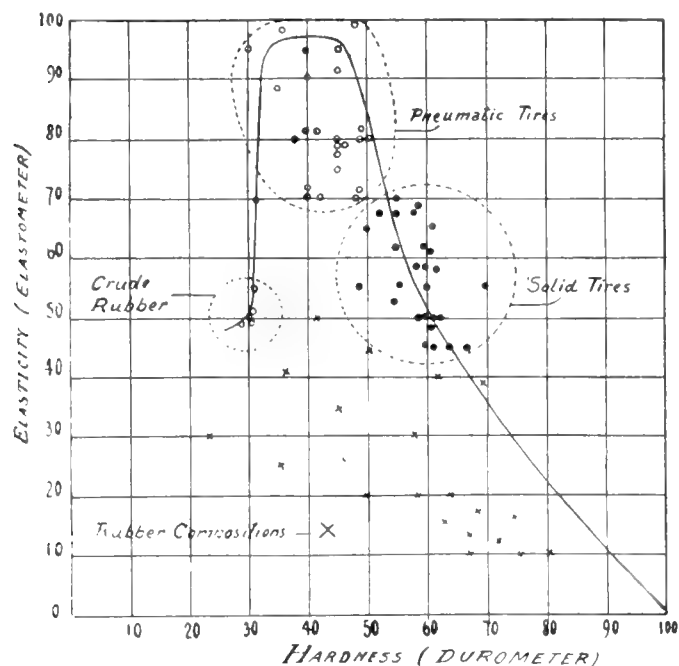


CHART SHOWING TESTS OF ELASTICITY AND HARDNESS.

mospheric temperatures may become too soft at 212 degrees, and show compression, internal friction and further development of heat. On ordinary road temperatures, however, in hot weather, the efficiency of the rubber should not visibly be impaired.

When rubber is stretched its elasticity may or may not be constant when the duration of the stretch varies. In other words, if rubber is stretched only for a moment it may show a higher elasticity or hardness than if it were stretched for some length of time. Consequently, in the less elastic rubber goods the permanent set will be developed under the continued pressure of the indicating pin. This is shown by the gradual recession of the indicating hand.

To meet this peculiarity in testing, a special holding stand has been provided. The same stand also serves to avoid possible side friction on the sensitive pin, due to not holding the instrument straight when used free handed.

The following table of rubber values may be of interest in this connection:

AVERAGE AND EXTREME VALUES OF PLIABLE RUBBER ARTICLES.					
	Hardness.	Elasticity.	Total.	Scleroscope.	Percentage of Stretch.
Lowest.....	25	10	620	30	50
Average.....	50	65	2,620	58	255
Highest.....	70	100	4,800	100	1,500

SOLID TIRES.					
Low.....	52	45	2,900	55	500
Average.....	60	60	3,600	61	650
Highest.....	70	70	4,000	70	750

PNEUMATIC TIRES.					
Low.....	35	65	3,000	..	400
Average.....	42	80	3,300	..	500
Highest.....	70	100	4,800	..	1,500

RUBBER HEELS (some only hard compositions).					
Low.....	55	5	425	..	.....
Average.....	74	28	1,683	..	.....
Highest.....	85	60	3,600	..	.....

RUBBER BANDS.					
Low.....	35 45	80 95	.....	75 85	70 1,500

Study of the figures in this table will disclose several interesting facts, among them a limit of what has been referred to as the total value of rubber. The two gages here described have each a scale of 100 units, and if 100 is multiplied by 100 a product of 10,000 will be obtained. In rubber this is not possible. The highest value found in the course of our experiments was in a pneumatic tire, which showed a hardness of 48 and 100 per cent. elasticity, which gives a product of 4,800. The highest value noted in solid tires of a high grade was only 4,000, thus showing that too much vulcanizing or compounding deprives rubber of elasticity and toughness. The limit appears to have been reached in the processes hitherto used for solid tires. Just to what extent rubber can be vulcanized or compounded without materially detracting from its characteristic elasticity, which is here represented as 100 per cent., remains to be shown. The many experiments upon which these figures are based would appear to indicate a total value of 5,000 as about the limit, or just half of the range of measurement provided for by the two instruments.

RUBBER PLATES FOR IRONCLADS.

THIS publication has referred a number of times to the suggestion made by various people interested in naval construction that the resistance to attack of an ironclad would be greatly increased by a suitable covering of rubber. The claims made by Mr. Bowler, an English inventor, for the rubber plates which he had devised for application over the iron plates of warships were mentioned on page 290 of the February issue. He has been trying to persuade the British Admiralty to experiment, at least, with this method of rubber protection. In a recent number of a British daily, he cites further instances coming under his own observation of the superior resistance of rubber to the effect of explosions over any other material.

"In 1906," he writes, "I witnessed the effect of an explosion of about 200 tons of dynamite at Bramfontein, Johannesburg. It occurred on a siding used for shunting dynamite-laden trucks. Special precaution had been made at the head end in a rubber buffer, so that if the trucks did run loose the rubber would lessen the shock and perhaps prevent an explosion. The trucks dashed with such force into the buffers that a terrific explosion took place, killing more than 300 people. Trucks and siding were blown into the air, and on examining the spot half an hour after the explosion I noticed that nothing was left but the rubber buffers, which remained intact, barring some rents and cuts made by flying projectiles and scorching by the heat. This was proof of the extraordinary resisting powers of rubber.

"In an experiment made to show the recoiling strength of rubber a piece of rubber 2 inches thick and 1 foot square was laid under a steam hammer and a 6-inch round shot was placed on it. The hammer fell with tremendous force and broke the shot to pieces, while the rubber remained elastic and unimpaired."

The estimated number of automobiles owned in the United States in 1914 was 1,754,570. Assuming that these cars average not less than five tires each during the year, 8,772,850 tires were necessary for their equipment.

The Rubber Joke.

IN "Gum-Elastic and Its Varieties, with a Detailed Account of Its Application and Uses," which was not only the first rubber book published in this country but which still remains the most interesting contribution to our rubber literature, Charles Goodyear gave a list of 400 different articles that could be made from this substance. Considering the fact that rubber



THE RUBBER PLATE LIFTER.

had but recently come into use, it was a list of extraordinary completeness. Though it was compiled 62 years ago, almost every rubber development that has taken place since was prac-



THE EFFECT OF THE DANCING PLATE ON THE UNINITIATED.

tically mentioned in that list—with one exception. It said nothing whatever about rubber jokes. But this omission was quite natural under the circumstances, for, in the first place, Mr. Goodyear himself was a man of an exceptionally serious cast of mind. Moreover, he lived in a very serious age which had not yet begun to cultivate the lighter side of life.

But times have changed, and man no longer looks upon himself as simply a working animal. He insists upon being amused. Hence, among other forms of entertainment, the rubber joke.

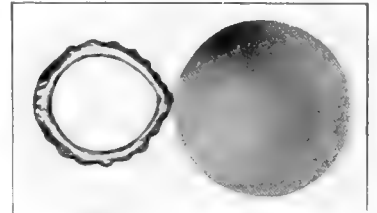
The rubber joke is really a logical development. The very nature of the substance—its elasticity, plasticity, its ability to undergo all manner of distortions and contortions and then return serenely to its original form, and particularly its possibilities in the way of pneumatic effects—its ready conveyance of air pressure—all make it a wonderfully effective agency for the players of pranks, and especially for that arch humorist known as the practical joker.

It probably would be stretching the subject a little to say that rubber jokes are as many as the sands of the seashore, but it is certainly true that if they were all collated they would fill a very sizable catalog. And the number is being added to every week. This dissertation is not intended as an inventory; but its purpose is simply to describe a few of the more popular (or more unpopular—it depends upon which end of the joke you happen to be) of the various forms that rubber humor takes. Perhaps the most effective of these rubber jokes are those that are provided with a bulb and tube for accomplishing pneumatic effects—with results that are often startling. One of the most noteworthy of this class is the plate lifter. This consists of a small, thin rubber bag which when uninflated has hardly any perceptible thick-

ness. It is connected by a fine rubber tube several feet in length with a rubber bulb. Its use is after this wise: Before the diners are invited to take their seats, the bag is slipped under the tablecloth in front of the intended victim, under the place that his plate will naturally occupy. The tube goes invisibly under the table, across to the other side, where the operator is to be located. By pressure on the bulb the bag under the tablecloth is inflated and the plate is made to rise and fall, gently or with violent movement according to the nature of the pressure on the bulb. It requires no very vivid imagination to see what can be accomplished by an apparatus of this sort on a suitably susceptible person.

Instances have been cited where club men have played this prank on some fellow member who was known to be unduly addicted to the absorption of stimulating beverages, with the result that the victim, after watching the various dishes in front of him wave and wobble and jump and dance during a whole dinner, has fled from the banquet board and made his way with all possible speed to the nearest Keeley cure.

Another rubber joke of the pneumatic class consists of some sort of button-hole ornament connected by a small, almost imperceptible, tube with a bulb carried in the pocket. This ornament may be in the form of a baby's face, which, on the pressure of the bulb, is seen to protrude its tongue most indelicately and is heard to wail most plaintively; or possibly the ornament may be a design filled with little apertures and the bulb may be filled with water, with the result that when some admiring friend stops to look at the unusual ornament he receives a gentle April shower in his face. That suggests another type, which we may call the aqueous rubber joke. A second good illustration of this kind is the sprinkling ring. This consists of a hollow rubber ball large enough to be held conveniently in the hand, to which is attached a hollow metal ring with fine openings at the top. The ball is filled with water and the ring slipped over the finger. It is shown to some friend and as he is viewing it with interest the ball is squeezed and he



THE SPRINKLING RING.

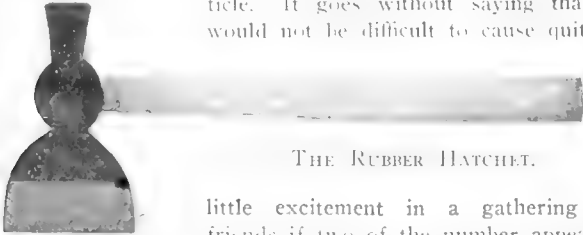
gets a facial inundation. These water jokes are supposed to particularly endear one to one's friends, especially where the friends have to wear moist collars during the remainder of the day.



GETTING A SHOWER FROM RING WITH RUBBER BALL ATTACHED.

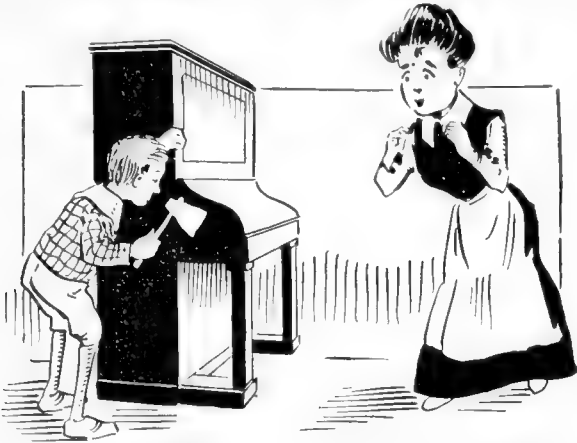
Another classification of the rubber joke might be called the edged tool variety. These are not innumerable, but they cer-

tainly are numerous, and they counterfeit all tools that have sharp and dangerous points and edges. For instance, there is the rubber razor. If a young man wants to attract considerable attention in the boarding house parlor he can jump to the middle of the floor and announce that his life has been a failure and he proposes to end it forthwith, and then gash at his throat with one of these rubber razors. It is quite evident that he would create considerable commotion—especially in the breast of his landlady if he were somewhat in arrears for board. Then there is the rubber dagger, looking for all the world like the real article. It goes without saying that it would not be difficult to cause quite a



THE RUBBER HATCHET.

little excitement in a gathering of friends if two of the number appeared to get into an altercation and one suddenly pulled forth this shining weapon and proceeded to plunge it rapidly into the other's front, back, side or some other suitable location. The rubber hatchet belongs to the same category. Arm a small boy with one of these and let him make a savage onslaught with it on the



CHOPPING THE PIANO—WITH THE RUBBER HATCHET.

choice marble statuette in the parlor, or on the piano, and it is obvious that he would have his mother in a state of mind.

Again there is the rubber tack. If a person wishes to attract favorable attention to his general imperviousness he can put a few of these, point up, on a table, with his friends seated around, and then bring the palm of his hand down with great vigor on the upturned points. He can then gather in the tacks and go whistling away, to the great perplexity, if not admiration, of the onlookers.

Rubber jokes of this variety are often used as nerve testers in initiating new members to secret organizations. One form is a bed of spikes with sharp steel points—made of soft rubber. The novice is obliged to remove his shoes and stockings and then is tossed upon the glittering points. As a matter of scientific fact, the efficiency experts have employed rubber deception in making their tests. One test of a man's nerves is to suspend a pane of glass from the ceiling, have him stand with his face close to it on one side while the experimenter strikes the pane from the other side with a hammer. It is a rubber hammer, and the glass, instead of being shattered into a thousand pieces, simply oscillates gently in the air. But if the subject of the test can stand the experience without wincing he shows that his nerves are in good condition.

There are other rubber jokes, not quite so sanguinary as some of those cited above, which deceive and excite wonderment without causing either alarm or mental anguish. As an illustration

of this kind is the rubber dumb-bell, which looks as if it were made of solid iron with each end weighing 100 or 200 pounds, and yet the athlete who is giving an exhibition of his powers can hold this dumb-bell indefinitely at arm's length or toss it easily from one hand to the other and perform with it various feats of Samsonian strength. It behooves him, however, not to let it fall to the floor, for it is likely to rebound as high as his head, for the two massive iron ends are simply inflated rubber balloons and the entire dumb-bell weighs rather less than 3 ounces.

The rubber pencil is another joke of an innocuous character. It looks like an ordinary lead pencil sharpened at both ends and supplied with a metal cap which covers the end not in use. One end has good lead. The owner uses this to write with and then, putting the metal cap over it, passes the pencil to a friend to use. He gets the rubber end and when he tries to write finds the fictitious lead bending in all directions and making no mark. He may make several attempts before he discovers what the difficulty is. And then there are other pencils which have perfectly good lead but a rubber joint just above the lead which makes the pencil double up when one tries to use it. And there are perfectly good and honest looking pens constructed on the same aggravating principle.

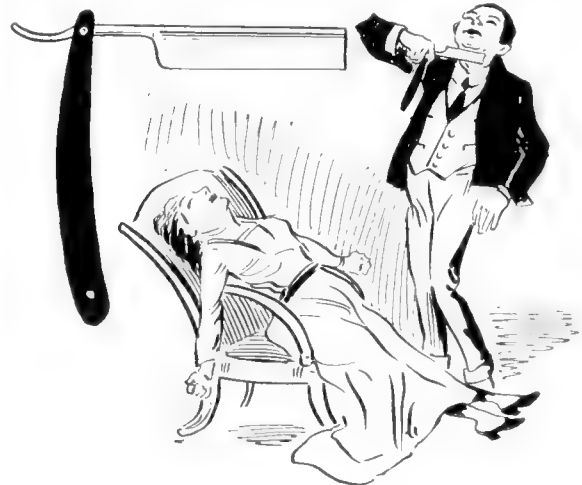
But this was not to be an inventory. These samples are enough to show the nature of the rubber joke. Now the interesting question arises—How much of a business does the rubber joke constitute? How many people are engaged in its sale?



THE RUBBER DAGGER.

Where do they find customers? And what volume of this rubber humor finds a market in the course of a year?

There are about 100 jobbing houses in the United States which sell these rubber jokes—not exclusively, of course, but with various other novelties. The retail dealers, including distinctive novelty stores, of which there are some in all large cities, and



HARMLESS SUICIDE—WITH THE RUBBER RAZOR.

including also the big department stores—all of which, practically, carry these articles in some department, either among the rubber goods or on the novelty counters—probably number 5,000 in this country. This would take in all those people who have booths and counters at the summer beaches, at the autumn fairs and at the carnivals and mardi gras held at different times in various places. While these humorous rubber goods are sold in all the large cities of the country, their best market is found

in New York, Chicago and St. Louis. Whether this is to be attributed to a keener ability to see a joke on the part of the citizens of these three cities, or to a less serious type of mind, may be left to the psychologist to determine, but these three cities not only surpass the others in the number of novelty stores where



A RECKLESS BLOW ON SHARP POINTED TACKS—OF RUBBER

goods of this kind can be obtained but they support a larger number of street vendors who sell these humorous rubber conceits and demonstrate them as they sell.

These street salesmen constitute the main channel through which these rubber mirth-makers reach the ultimate consumer. It is estimated that there are a thousand of these itinerant merchants in New York and probably 15,000 in the whole country. Adding this army of street vendors to the more dignified dealers who offer their wares from behind a counter and under shelter, there are probably 20,000 honest citizens who are engaged in supplying the great American public with these rubber contributors to the joy of living. Formerly, before the subjects of the Kaiser had so many other things to occupy their minds, many of these conceits came from Germany. But now we must rely for our supply on home production. There is no mill in the United States devoted exclusively to the manufacture of rub-



LIFTING A THOUSAND POUNDS—ALL AIR

ber jokes, but there are several that turn them out as an incidental but thoroughly established line of manufacture.

As to the value of these articles sold in this country in the course of a year, one big wholesaler puts it at \$2,000,000, and probably he is not so very wide of the mark. Possibly some one might say that this seems like a large sum to spend for

articles made just for fun, but when one reflects how large a proportion of the product of the *Hevea Brasiliensis* goes into garments, shoes and hot water bottles for the comfort of the body, there seems full justification for the question—Why should not a small fraction of this product be turned into forms that contribute to the pleasurable activities of the mind and to the general gaiety of the nations?

TRADE OPPORTUNITIES FROM CONSULAR REPORTS.

A firm in Spain is in the market for materials for manufacturing rubber stamps. Report No. 16,148.

A business man in Spain requests samples, prices, etc., on electrical supplies, including insulated wire. Report No. 16,233

A dentist in the West Indies considers the establishment of a dental supply depot and wishes correspondence with manufacturers. Report No. 16,253.

A firm in Russia also desires similar correspondence. Report No. 16,255.

A Swiss firm is in the market for refined Pará rubber for the manufacture of a solution to be used in repairing tires. Report No. 16,263.

A business man in France desires to secure agencies to represent American manufacturers and exporters of rubber sponges and articles made of hard and soft rubber, to be used in connection with surgical, electrical and similar instruments. Report No. 16,288.

A firm in Russia wishes to be placed in communication with American exporters of raw rubber. Report No. 16,341.

A business man in Italy desires correspondence, in Italian, with American exporters of rubber. Report No. 16,374.

Prices and quotations c. i. f. Russian ports are requested on rubber goods for surgical and hygienic purposes. Report No. 16,183.

An opportunity is reported from Switzerland for the sale of solid rubber tires. Report No. 16,413.

A firm in Italy is in the market for large quantities of articles of rubber, gutta percha, etc. Report No. 16,432.

A business man in France desires to purchase rubber sponges, gutta percha and hard and soft rubber articles. Report No. 16,438.

A company in the United States is in the market for supplies to be used on a rubber plantation in the East Indies. Report No. 16,457.

A foreign business firm desires to purchase large quantities of red rubber bands for preserve jars and glasses. Samples may be obtained from the Bureau of Foreign and Domestic Commerce, Washington. Report No. 16,535.

A RUBBER PRODUCING SHRUB IN AFRICA.

An English reader sends this publication a letter received from a friend who has recently been exploring certain tracts in Africa. One paragraph is of particular interest, as it describes a shrub which the explorer says yields "rubber gum equal to any plantation product." The paragraph is as follows:

"I have for two months past been exploring several hundred square miles of the hinterland, all covered with a wild shrub from which can be pressed (with a sugar mill) rubber gum equal to any plantation product. The supply seems to me to be almost unlimited, the cost of the right to cut the shrub a mere trifle, and so also the cost of pressing. I reckon the gum all together will cost at the coast less than half that of plantation."

The Tayson Rubber Co., of Wooster, Ohio, is now manufacturing "Tayson" tires.

THE EDITOR'S BOOK TABLE.

EXPORTERS' ENCYCLOPEDIA, 1915. ELEVENTH EDITION. COMPLETE EXPORT SHIPPING GUIDE. Published by the Exporters' Encyclopedia Co., of New York City. 1880, 1,100 pages, cloth bound. Subscription, \$7.00, including monthly corrections, and the "Exporters' Review" for the calendar year.]

AS may be inferred from its title, this publication contains all possible information concerning the export trade. It covers all the countries of the globe. It gives all steamship lines and their agents and all information concerning shipping routes. It covers bills of lading, invoicing of merchandise, foreign equivalents and currencies, insurance, banking, protection of trade abroad, consignment of goods; in short it gives all the information necessary to those who wish to export or are already engaged in exporting. The Exporters' Encyclopedia answers every question that an exporter may be confronted with. The shipper needs only to know the country to which shipment is to be made—the "Index of Countries" in the Encyclopedia tells him where to find the entire story for that country. It is, in fact, an invaluable book of reference for every firm or company doing business, large or small, with foreign countries.

SOUTH AMERICA AS AN EXPORT FIELD. BY OTTO WILSON, commercial agent of the Department of Commerce, Government Printing Office, Washington, D. C. 1880, 216 pages. Paper cover.]

The Department of Commerce, Bureau of Foreign and Domestic Commerce, has published a hand-book on "South America as an Export Field," which contains much information for those who are interested in the possibilities of South America as a market for the products of United States industries. Of special interest to rubber men is the description of the important role rubber plays in economic conditions in certain South American countries. He shows how the rubber business affects the purchasing capacity of a large section of Brazil, where the rubber gathering industry is the greatest source of wealth.

Business is practically all based on credit. The concessionaire, who operates a tract of land under government franchise, advances supplies for a whole season to his employes, or *seringueiros*, charging them against rubber which they are to collect and turn over to him. Usually the concessionaire obtains these supplies on credit from an importer at Manáos or Pará. To obtain this credit the concessionaire has to pledge to the importer the whole of his rubber crop. The importer, in turn, receives his merchandise on credit from foreign merchants, often rubber speculators. So that the prosperity of trade in the rubber districts of Brazil is directly dependent upon a successful rubber season. The high cost of rubber production in Brazil is largely due, according to the author, to the high prices of all imported commodities in that country, where many articles often cost five or six times as much as they do in the United States.

Brazil produces considerable quantities of cotton, especially tree-cotton, most of which is exported to England and Portugal.

NEW TRADE PUBLICATIONS.

W. G. BROWN & Co., of Cincinnati, dealers in crude and reclaimed rubber, are continuing for 1915 the distribution of small monthly calendars. Each of these has, besides the days of the month, a 5 x 4 inch picture, in colors, showing sportsmen indulging in the variety of sport most appropriate to that particular month.

The Firestone Tire & Rubber Co. has lately issued a very complete and handsome book on "The Care of Tires." If used as a text book by the consumer and its instructions carefully followed, the result at which it aims—the elimination of unnecessary tire expense—would doubtless be arrived at. This book, which is freely illustrated with reproductions from actual photographs, shows conditions caused by every kind of tire abuse

and is the result of much experience and many years of research. Copies will be furnished, free, on request, not only to users of Firestone tires but to car owners generally.

E. H. Sargent & Co., of Chicago, importers and makers of laboratory supplies, have just issued a very complete catalog in which all the latest appliances for use in the rubber mill laboratory are illustrated.

"A LITTLE JOURNEY TO THE HOME OF COLONEL COLT"

Among book-worms of the higher sort, Boswell's "Life of Samuel Johnson" has always been looked upon as the most notable biographical contribution to literature; all of which is undoubtedly true. But it is not half so readable as the biographical sketch of Colonel Samuel P. Colt which appears in the April number of Elbert Hubbard's "Fra," and fills nine pages of that lively magazine. Albeit this sketch is done in the breezy style that distinguishes Elbert Hubbard from all other contemporary wielders of the pen, it is a faithful portrait and will be much enjoyed by the colonel's innumerable friends.

BOOKLET ON "CABLE-STRUCTURE" TIRES.

A red motor car, with a load of happy passengers speeding through an enormous "non-skid" tire, artistically enlivens the cover of a neat booklet issued by the Mansfield Tire & Rubber Co., of Mansfield, Ohio, to describe the merits of "Cable-Structure" casings, and also the special qualities of the "5-X" inner tubes which are manufactured by that concern.

THE "KNU-SHU" HANGER.

The United States Rubber Co. has recently issued a placard 13 x 18 inches in size, printed in three colors, to call attention—on the wall or in the window—to the "Knu-Shu." The card shows a large-size side view of the shoe and has a second cut showing the heel and sole. There are four corner illustrations intended to picture some of the logical wearers of this novel shoe. A brief description of this interesting specimen of footwear is also printed on the card, from which it will be discovered that the uppers are made of strong auto tire duck; that the sole is made of a special rubber, stitched by a new process to give greater service, while the heel is of the rubber cushion variety, which makes walking jarless and joltless, buoyant and exhilarating.

SPANISH FIRM IN THE MARKET FOR RUBBER.

TO the Editor of THE INDIA RUBBER WORLD:

I have received a letter from Mr. Francisco Blasi, my cousin, of the firm of Blasi, Sagué & Pallás, manufacturers of rubber goods, Roger de Flor street, No. 170, Barcelona, Spain.

In this letter he asks me to write to you and inquire if you know any firms who are willing to enter the Spanish trade dealing in rubber. He is interested in raw rubber (guayule), rubber substitutes (facticios), and sulphur (or sulphate) of antimony (crimson and golden).

As editor of THE INDIA RUBBER WORLD, will you not kindly place some firms in touch with Mr. Blasi and have them send samples by mail, with price lists, etc. Mr. Blasi's firm has been cut off from their regular rubber supply and they will have to shut down their factory unless they can get their goods from the United States. They are, of course, responsible people and are ready to deal on cash terms. Kindly write me what action you take on this letter.

Very truly yours,

F. VALL-SPINOSA.

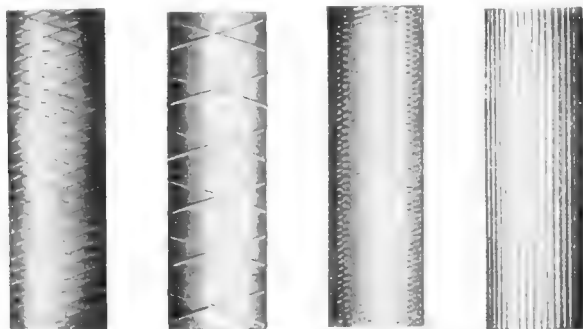
San Juan, Porto Rico, March 28, 1915.

The Thermoid Rubber Co., of Trenton, New Jersey, has opened an office in Detroit, to distribute its brake lining, bumpers, clutch facings, discs, hose, tires and other rubber products.

New Rubber Goods in the Market.

RUBBER GRIPS.

THE rubber grip, which is used to some extent in this country and has met with favor where once introduced, constitutes an important item in the output of some of the large British manufacturers. It is used very extensively in England on cricket bats, golf clubs, tennis rackets and hockey sticks. The illustration shows four of the many designs made by a leading manufacturer of sporting goods specialties. They are made



of high grade red rubber, in several thicknesses. The tennis racket grips are made from 7 to 9 inches long; those for golf clubs 10 inches, some styles being tapered at one end; the cricket bat grips are made 12 inches in length, and the hockey stick grips 15 inches. [W. & A. Bates, Limited, St. Mary's Mills, Leicester, England.]

THE INK-PENCIL.

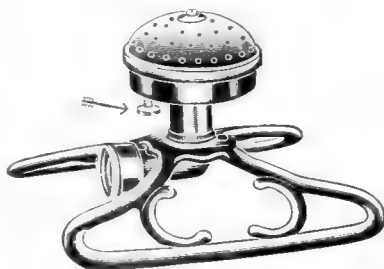
The ink-pencil is a recent product of manufacturers who in the past have specialized in making fountain pens. These are made of hand-turned, highly polished hard rubber, fitted with writing points and needles of precious, non-corrosive metal not affected by the action of ink. A soft rubber plug is inserted in each cap, to prevent leakage when carried in any position and



also to keep the point moist and ready for instant use. These ink-pencils, while excellent for ordinary writing, are particularly adapted for manifolding and ruling. The barrels are made of black, red, brown and olive green rubber, plain, chased and ornamented with gold bands and other trimmings, and with various ink capacities, from the "baby" size to the "banker." [J. Ullrich & Co., 27 Thames street, New York.]

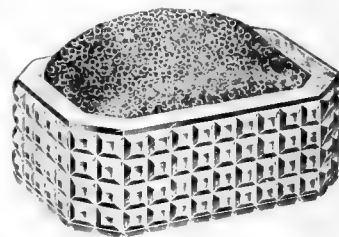
A VERSATILE LAWN SPRINKLER.

The "Sunset" lawn sprinkler, which the manufacturers nickname the "Twicez-Good," is one of the interesting novelties of the season in this line. The Sunset acts both as a regular lawn sprinkler covering a round area, and also as a half circle sprinkler for use along sidewalks and fences. The change is made by a little thumb screw under the head of the sprinkler which makes it possible to cut off one-half of the flow of water, allowing the shower to cover a semi-circular area only. The manufacturers maintain that the Sunset is practically two lawn sprinklers in one; hence the "Twicez-Good." [W. D. Allen Manufacturing Co., Chicago.]



RUBBER STAMP MOISTENERS.

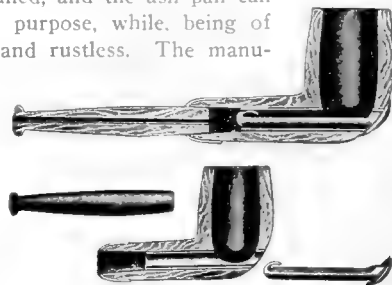
Two new styles of sanitary stamp moisteners are shown in the accompanying cuts. The "Hornet" moistener is made entirely of rubber, having a hard rubber handle to contain water, which feeds through a rubber valve and automatically saturates the rubber sponge. The other is the "Stable" moistener, which is made of glass, hard rubber



and a sanitary rubber sponge. [The Weeks-Numan Co., 81-3 Fulton street, New York.]

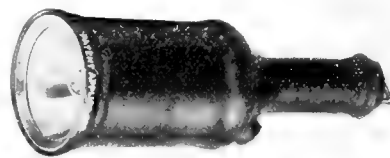
A "HYGIENIC AND HEALTHFUL" PIPE.

This is the description given by the makers of the new Willis pipe, a pipe that has a hard rubber bit and an ash pan. The bit, can, of course, be cleaned, and the ash pan can also be removed for this purpose, while, being of aluminum, it is tasteless and rustless. The manufacturers state that, although they make pipes with bits of many other kinds, at least 95 per cent. of all orders received specify the hard rubber sort, which they claim to be the most popular on the market, not even excepting the amber, which has hitherto been the bit best liked. [The Willis Co., 76 Pilling street, Brooklyn, New York.]



COVER FOR HAND SEARCHLIGHT.

A hand searchlight cover for fire departments, submarine use and mine rescue work has recently been patented by Frederic W. Sparkman and assigned to the Goodyear India Rubber Glove Manufacturing Co., a subsidiary of the United States Rubber Co. The cover fits like a glove and is made of a high grade material to prevent water from short circuiting the light where it is likely to be used in or about much water. The pin, which is pressed to put on the light, may be turned from the outside of the cover to set the light for a given time.



A NEW HARD RUBBER SUBSTITUTE.

"Kasenoit" is the name of a new material brought out in London to take the place of ebonite, galalith and xylonite for many purposes. The properties of this material are quite similar to those of galalith—it is tough, resilient, easy to machine, non-inflammable, a good insulator, capable of being molded, to a certain extent, and is made in a variety of colors, either as sheet or rod. It can be turned and polished and takes an excellent thread. [A. W. Kanis, 66 Aldersgate street, London, E. C.]

WATERPROOF COVERS FOR THE MOTORIST.

Storm aprons or protectors of some kind are necessary features of the automobilist's outfit, and since the opening of the present season some excellent models have been shown. The cut here-with illustrates a storm apron which is made in sizes from the two-passenger runabout to the five-passenger large tonneau size, at

prices from \$10 to \$15, of rubber cloth. These aprons have slip openings with yoke collars fitting closely around the neck, with snaps for closing in case the car is left vacant during a shower, the apron fitting the car perfectly and being absolutely waterproof. Each apron is packed in a waterproof bag suitable for storing away when not in use. [The Gilbert Manufacturing Co., New Haven, Connecticut.]

The other cut shows a waterproof protector of similar nature for the motorcyclist. This is in the form of a cape, made of light weight raincoat rubber cloth, affording protection to the machine at the same time that it shields the rider from rain, mud and cold. It has fastenings to hold it over the handle bars, and is so arranged that it does not inconvenience the wearer in dismounting. It can also be folded compactly for carrying [Nathan Novelty Manufacturing Co., 84-90 Reade street, New York.]

THE "SLIPKNOT" RUBBER HEEL.

The demand for rubber heels is engaging the attention of many of the large manufacturers of rubber goods, and as shoe styles increase in number and variety, the more rubber heels are needed. The "Slipknot," though a comparatively recent addition to the supply of heels on the market, has been well received, the features which it is claimed have contributed to this favorable reception being its uniform composition, durability and correctness of size and shape. [Plymouth Rubber Co., Canton, Massachusetts.]

THE DIAMOND ACE GOLF BALL.

This ball, the latest type brought out by the manufacturers of a long line of golf balls under the "Diamond" and other brands, is said to have the endorsement of some of the best-known professionals of the country, to have perfect flight and an extremely long carry and wonderful roll, besides being durable and retaining its shape. [The Worthington Ball Co., Elyria, Ohio.]



The "Kewpie" is a new side garter for children, both the single top section and the double suspender ends being of elastic. These are joined by buckles of rustless nicked brass similar to the clasps. The garter is attached to the child's waist by a "pin that locks," said to be an exclusive feature of this garter. Each pair is put up in a sealed envelope. [Arthur Frankenstein & Co., 516 Broadway, New York.]

AUTO-PNEU-MATIC INNER TUBE.

This inner tube, instead of being one continuous air chamber as is the case with the ordinary inner tube, consists of a number of sectional pieces of tube, requiring from 12 to 20, according to the size of the wheel, to constitute a complete tire. These sectional pieces or individual rubber bags are all joined to a small circular metal tube which acts as an air supply conduit.

Each bag or section is screwed to a valve set every 4 inches along the outer circumference of this conduit. By a turn of the control stem, each valve is opened to the main conduit, thereby making the separate sections practically one inner tube. Then the air is pumped through the main valve stem until the required air pressure is obtained, which will be the same in every section. By turning back the control stem, each valve is closed, and each section becomes an independent unit.

In case of a puncture, the 4-inch bag which has been punctured collapses, and each adjoining sack or section will expand, taking the place of the punctured bag. Tests have demonstrated that five or six punctures may be made before it is necessary to stop.

To remove the punctured bag, the air control stem is turned, which opens all the valves, and partly deflates the inner tubes. By means of a special tool provided for the purpose, the edge of the shoe immediately over the punctured section is raised, the punctured bag removed and a new one screwed in place. [G. V. Baillard, 251 East Thirty-first street, New York.]

THE "NOAIR" COMPRESSION TIRE.

The "Noair" is a new tire which costs about the same as the high grade pneumatic, but which, it is claimed, gives 17,000 miles of uninterrupted service and saves the cost of shock absorbers, the strain on the car and also accident insurance. The tread of this tire, which is made of solid rubber, is lined with steel. The rim rests on a crown of rubber, which is supported on a resilient



suspension, so that all shocks are absorbed inside the tire. This tire has a purchase on the rim which is mechanical and does not rely on inflation. It has the tenacity of the solid tire, without either wire or fabric and, also according to the claim of the manufacturers, will sustain a maximum compression that would burst a pneumatic tire. [W. J. Spencer, 1504 Green street, Philadelphia.]

A NEW JENKINS DISC

A new disc made of rubber composition and to be known as the "Jenkins Bros. No. 119," has just appeared on the market, after a series of tests which are said to have shown the composition to be hard, but tough and flexible under service when in steam pressure; to possess freedom from cracking and flaking and durability in working steam pressures up to 150 pounds. This new composition will hereafter be used in all of the manufacturers' standard pattern globe, angle, cross and radiator valves when intended for steam service. [Jenkins Bros., Elizabeth, New Jersey.]

RUBBER IN FISHING.

SUCCESS in fishing no longer depends chiefly upon the skill of the fisherman, but with every season is due in greater measure to the ingenuity of the manufacturers of fishing paraphernalia, until the disadvantage lies now wholly with the fish.

The fisherman's first concern, after his rod, lies of course in the direction of bait. Those who in the past have carried their flies, spinners, etc., in a tin box, where they became entangled



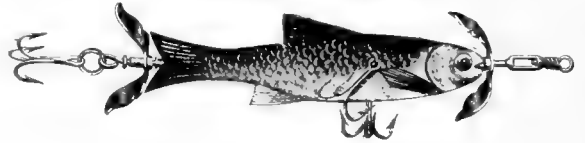
beyond any hope of quick extraction, will appreciate the fly-book illustrated here and which has just come on the market. This book is absolutely waterproof. The cover is made of durable rubberized leather and is fastened with a glove snap. The metal parts are of brass or aluminum and cannot rust. The loop of the bait is attached to a metal peg and the hook caught in a rubber band stretched for that purpose from one peg to another. These rubber bands can be adjusted for any size of spinners or flies, eyed or snelled, and the sheets for holding them can be taken out or new ones added, as desired. This book holds the flies, etc., flat, and makes it possible to remove them with one hand. [The John Hildebrandt Co., Logansport, Indiana.]

Another improvement of the present season is in the apparatus used for spraying dry flies with oil. Instead of the old style bottle with a brush attached to the cork and carried in a leather case, we now have the rubber atomizer. This enables one to apply just the needed amount of oil and prevents matting of the wings and tackle. When not in use the glass tube telescopes into the rubber bulb and a stopper is inserted in the end of the tube. The illustrations show the atomizer ready for use and also closed to a length of 4 inches. [New York Sporting Goods Co., 15-17 Warren street, New York.]



Other of the new wiles by which man lures his victims from the watery depths, and in which rubber is made to lend its part, are in the form of the baits illustrated. The first is a bait of soft rubber, of a bright aluminum color with gold spots. It is intended for use where there are reeds and lily pads, or around

stumps and logs, being of the "weedless" variety, and it yields instantly when a strike occurs, so that the hooks which it protects are permitted to engage. The other is a new minnow. It also is made of rubber, tinted to counterfeit nature and strik-



ingly natural in appearance. Its intended use is in deep water casting and trolling. [William Shakespeare, Jr. Co., Kalamazoo, Michigan.]

As personal comfort is quite essential to the enjoyment of sports, rubber, of course, is very important in the proper outfitting of the fisherman in respect to his clothing. And styles change with the seasons even in fishing outfits. Here are shown two of the latest English offerings in fishing outfits. The first



illustration shows a short water-proof wading jacket worn as an accompaniment to the rubber fishing trousers, and a "Heintz" hat designed by a German sports authority of the same name. The other shows the "Kathador" slip-on, which is made of fabric interlined with a thin film of fine rubber. It is made with extra fullness that not only gives with the movements of the wearer, but thoroughly ventilates the garment. [J. C. Cording & Co., Limited, 19 Piccadilly, London, W.]

A NON-SKID DEVICE.

The illustration shows a new sectional non-skid attachment for dual tires for trucks and heavy vehicles, known as the B & B. non-skid. About 30 sections are required to fit each wheel. [Dockray & Tilton, Meadow Lane, Leeds, England.]

ALODIUM FOR TIRE PUNCTURES

Alodium is one of the newest compounds for sealing tire punctures. This is in liquid form, to be injected into the inner tube through the valve. Its nature is said to be such that, while it adheres only slightly to the tube under ordinary conditions, it will, under air pressure, adhere with great strength to the raw edges of a cut or puncture and in closing the puncture will not stick to the casing. [Lydon Manufacturing Co., 1514 Michigan avenue, Chicago.]



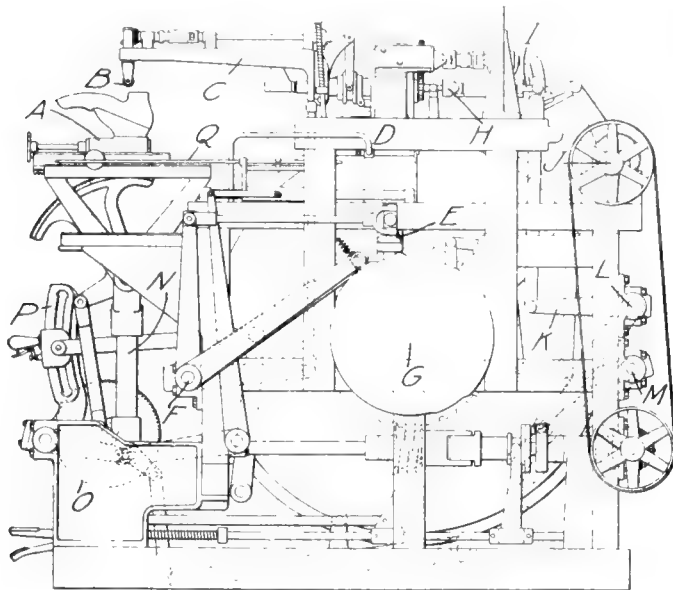
New Machines and Appliances.

RUBBER SHOE SOLE ROLLING MACHINE.

VERY few machines are in use in the manufacture of rubber boots and shoes; in fact the whole process of manufacture is a hand process. Winkley's machine, however, is designed not only to apply the sole to the otherwise finished shoe, but to roll it, pound it, and stick it securely, practically copying the motions used by the operative with the hand roller.

The machine is quite complicated and one outline cut is hardly sufficient to illustrate it in detail. The important parts, however, are shown and they are the shoe itself, which on its last is carried on a jack; above this works a shoe arm to which a roll is attached. The jack is moved backward and forward and turning, while the roll above it is vibrated and manipulated so that every portion of sole, heel, shank, forepart and beveled edge are thoroughly and quickly covered. This is a double ma-

chine and finishes a pair of shoes at one time. The illustration shows only one-half of the machine working on one shoe. [E. E. Winkley, United States patent No. 1,124,190.]



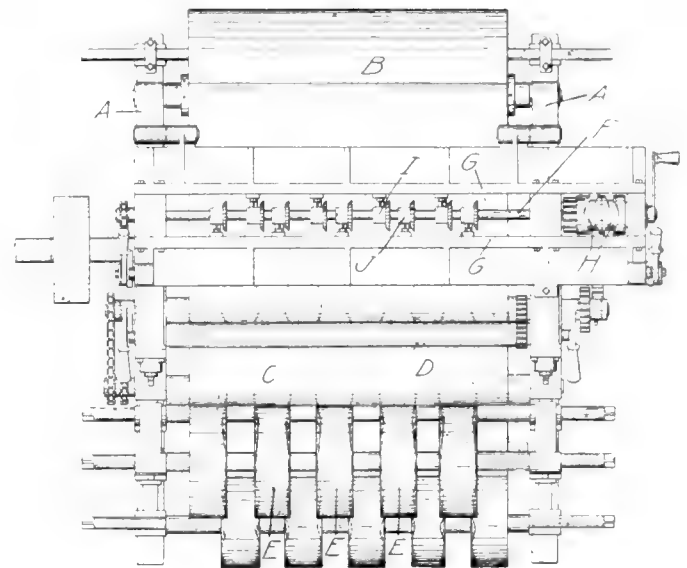
A—Jack, B—Shoe Roll, C—Shoe Roll Arm, D—Rocking Frame, E—Rocking Lever, F—Rock Shaft, G—Main Shaft, H—Universal Joint, I—Rocking Link, J—Eccentric Cam Shaft, K—Vibration Lever, L—Vibration Cam Shaft, M—Angular Vibration Shaft, N—Jack Slide Rod, O—Jack Slide Gear, P—Jack Link Motion, Q—Roll Controlling Rod.

chine and finishes a pair of shoes at one time. The illustration shows only one-half of the machine working on one shoe. [E. E. Winkley, United States patent No. 1,124,190.]

INNER SOLE CUTTING MACHINE.

THIS machine can be used for slitting any fabric in strips with straight or curved edges. Here it is described in reference to cutting sole linings, which are then wound with the proofed side down on reels so that the heel strip unwinds first.

The two side frames support the bearings of the various shafts and the driving mechanism. The cross frame which carries the lower cutter shaft, brackets, gearing, etc., is bolted to the top of the frames. Directly above this is a similar frame that carries the upper cutter mechanism. This is hinged to give access to the parts. The cloth is fed from the fabric roll around a guide roller and under and over two tension rollers. It then passes between the upper and lower revolving cutters and is slit into strips which then pass under and over the tension rollers, and between the feed rollers to the wind-up reels. The

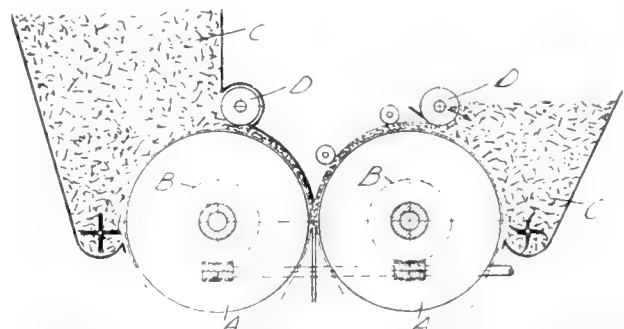


A—Side Frames, B—Fabric Roll, C—Toe Strip, D—Heel Strip, E—Toe Strip Reels, F—Upper Cutter Shaft, G—Reciprocating Cutter Bars, H—Cutter Bar Cams, I—Upper Cutter Bracket, J—Upper Cutter Gearing.

so that the heel strip unwinds first. [V. E. Jullien, United States patent No. 1,127,448.]

MACHINE FOR MAKING SHEETS OF ASBESTOS AND CEMENT.

THIS is a machine designed to make multiple layers of asbestos fiber and cement and form them into sheets. The illustration shows an end view in section. The perforated drums are mounted in bearings supported by side frames not shown in the drawing. They revolve toward each other and are driven from a cross shaft by worm and pinion gearing. The two hoppers containing the material are provided with agitator blades



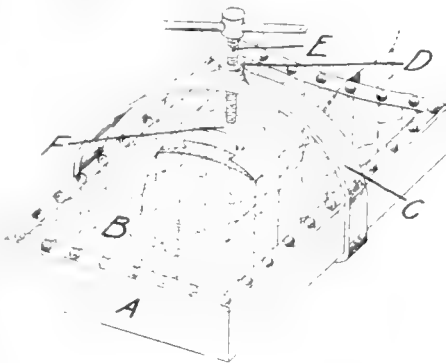
A—Perforated Drums, B—Worm Gearing, C—Hoppers, D—Feed Rollers.

that prevent the mass from settling to the bottom. The two perforated feed rollers are mounted parallel to the drums and revolve in the same direction. These rollers spread the material over the surface of the revolving drums and carry the two layers between their adjacent surfaces, where the material is formed into a continuous sheet.

The feed of the material on the right is regulated by adjusting the feed roller in the direction of the arrow, while the feed of the material on the left is constant. [G. Oeiser, German patent No. 281,713.]

RUBBER SOLE PRESS.

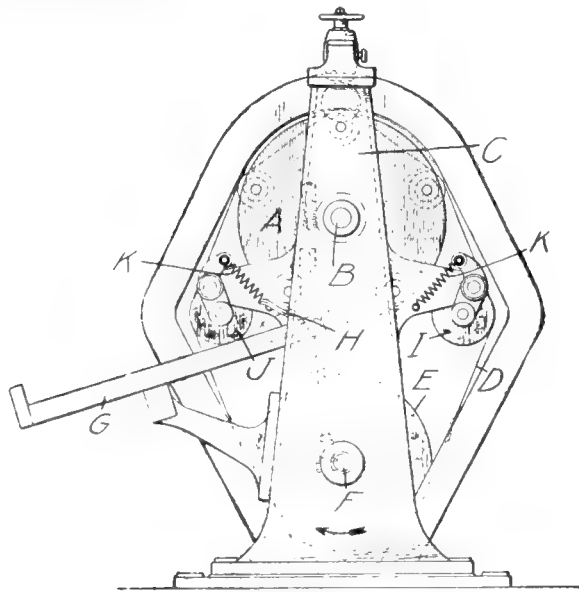
THE accompanying drawing shows a press for attaching rubber soles to boots or shoes. This press is composed of a frame *A*, over which a strong but flexible web *B* is tightly stretched and fastened. A curved metal band *C*, reinforced at its center, is fastened to the frame and extends over the web. The reinforced center of this band is provided with a threaded hole *D* through which the threaded screw *E* passes. This has at its lower end a press-plate *F*. By turning *E* the press-plate can be raised from or forced towards the web. The frame is cut out on one side so that the shoe can be set upright on the cradle formed by the web. A piece of rubber cut to shape is fixed to the under side of the press plate. [Continental Caoutchouc & Gutta Percha Co., German patent G. M. 621,569.]



IMPROVED RING CUTTING MACHINE.

THIS is an improved machine of the multiple mandrel type for cutting rubber tubes into washers and rings. The mandrels on which the tubes are placed are held between rotary discs, forming a sort of reel, and are caused to rotate as they are presented to the cutting arrangement. Once the cutting is done this movement of rotation is arrested so that the mandrels can be removed and new ones adjusted in their place. In this improved machine the mandrels are ejected automatically and fall on a receiving table, manual labor being limited to the placing of the mandrels in the machine.

The illustration shows an end view of the new machine, sufficient to explain the improvements. *A* is one of the mandrel-



carrying discs keyed to shaft *B*, supported by bearings in the side frames *C*. The mandrels are set in centers arranged on the discs and shown by dotted circles in the illustration. *D* is an endless belt driven by pulley *E* keyed to the shaft *F*. This belt causes the mandrels to rotate as they pass under the cutting arrangement. *G* is the table which receives them as they

are ejected by a tripping mechanism, and *H* a spring brake which arrests their rotation as they present themselves to the ejector. Idlers *I* and *J*, which maintain constant tension of belt *D*, are held in proper position by springs *K*.

The operation of this machine is continuous, new mandrels being adjusted by the operator without any stoppage of the machine. [Bertrams, Limited, and Robert Fausset Gillespie, both of Edinburg, Scotland. British patent No. 1,916.]

THE ADAMSON HOSE WIRING MACHINE.

THE illustration shows a machine designed to cover standard garden or steam hose with wire. It will wind a variety of sizes of wire, round, half round or flat, and in any pitch required. A novel feature of the machine is the mechanism that winds the wire so that it clings closely to the hose. This prevents unwinding in case any of the wire strands should break from use or be cut by accident.

In the process of winding, the hose is revolved as it passes through the winding head, where it is wired at the rate of 15 feet per minute. [The Adamson Machine Co., Akron, Ohio.]



OTHER DEVICES.

MOLDING RUBBER ARTICLES. A German invention provides for the manufacture of hollow seamless rubber articles by mechanically operated molds and a separate machine for closing the open end of the molded article.

The table of the machine is mounted on columns and supports two horizontal hydraulic presses. These open and close the mold, which is chambered for heating or cooling. The mold is located in the center of the table and is in two parts which slide horizontally and independently of each other. When the presses are operated simultaneously the mold parts are brought together in perfect alignment.

The core, which is attached to the piston of a vertical hydraulic press operating below the table, has grooves at its lower end that correspond with annular rings in the mold sections. These insure perfect alignment of the core and mold.

The top of the mold registers with a feed block that is fixed to the crosshead. This block is bored to fit the piston of a vertical hydraulic press mounted on the crosshead of the machine, and also communicates with the mold. The rubber stock is placed in the feed block in front of the piston, which forces it into the heated mold. The mold is then cooled, opened and the molded article removed.

The machine for closing the open end consists of a vertical spindle supported in bearings and driven by bevel gearing and a straight and cross-belt for reversing the spindle. The upper part of the spindle has left-hand threads and the lower part has right-hand threads. Threaded on the end of the spindle is a smooth cone-shaped former. Two toggle levers are pivoted to a loose collar at the center of the spindle, with their lower ends pinned to a nut threaded on the lower part of the spindle. The upper ends of the toggle levers engage an elastic rubber ring with a hole in its center.

The rubber article is slipped over the cone-shaped former and

the spindle revolved. This causes the toggle levers to open and enlarge the opening in the rubber ring through which the cone former forces the rubber bag or bottle, or whatever the article may be. The spindle is then reversed, the cone recedes, the toggle arms relax, and the rubber ring returns to its original shape and closes the open end of the molded article. [R. Daescher, British patent No. 7299.]

COLEMAN'S COLLAPSIBLE CORE—This invention provides a metal core upon which the casing is built in the usual way, and which can be collapsed and removed from the tire casing. It is made of metal and cored to reduce the weight. It consists of a rounded rim that corresponds with the body of the casing, a reduced neck and a broadened base to support the beads. The core is formed in four sections which are collapsed after the tire is formed, and withdrawn successfully through the inner opening of the casing. When the sections are assembled they are held in alignment by a removable annular ring which is channelled to fit the flanges of one side of the core. The inner circumference of the core sections has tapered recesses that fit the four wedge-shaped blocks through which pass the locking bolts. These also pass through angle plates attached to the annular locking ring and are threaded and provided with hexagon nuts on their outer ends.

The core is assembled by placing the locking ring on the core sections with the wedge blocks within the recesses, which are tightened by rotation. After the tire has been formed the securing plate and blocks are moved upwardly in the inclined recesses until the bolts and blocks are opposite the outlet of the recesses. Then the plates, blocks and ring are removed, which leaves ample space for the withdrawal of the core by removing one section at a time. [F. Coleman, United States patent No. 1,131,332.]

CELL DRIER NINETY INCHES WIDE.

THE biggest yet is always interesting. Several cell drying machines have been made 10 cells high and 82 inches wide for use by rubber companies in this country. But a drying machine was recently made at Taunton to be shipped abroad for use in drying duck 84 inches wide, which is probably the largest of these cell drying machines ever made. It consists of 10 cells and is 90 inches wide. It occupies a floor space 63 inches by 100 inches and stands 100 inches high. The cell units will use steam at 20 pounds pressure. It is built on the unit type, so that it can be readily added to at any time if desired. The rollers are of seamless drawn brass tubing, and oilless bearings are used throughout. The drive is by roller chain and sprockets.

On the drive side of the machine a removable steel housing is provided, with an opening for attaching to the ventilating exhaust line. By this arrangement, all moist air is drawn from each cell across to the drive side, warm dry air taking its place. This adds greatly to the efficiency of the machine, and permits drying thoroughly at higher speeds than could otherwise be done.

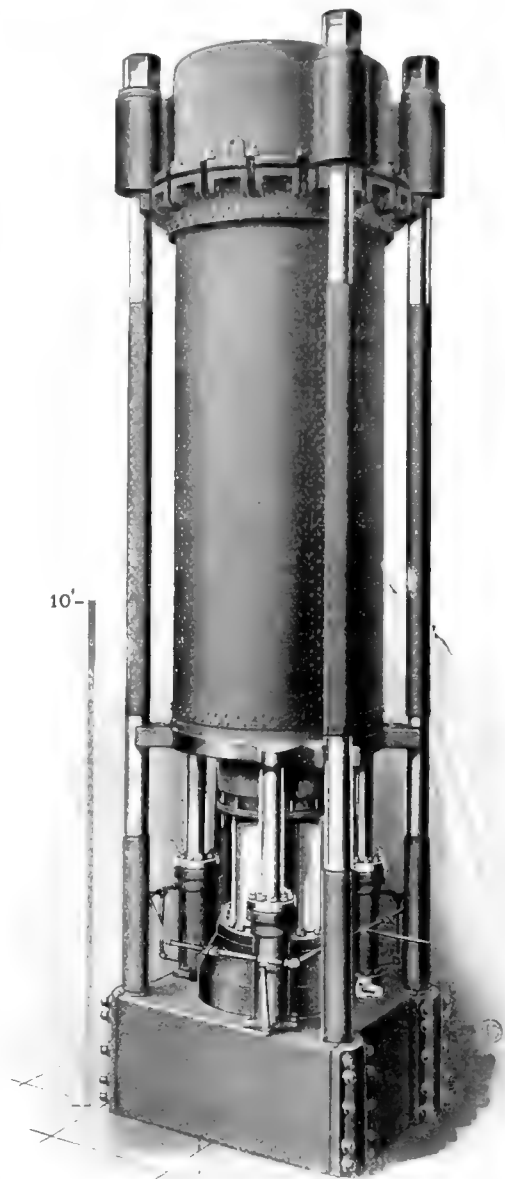
This huge machine was made by George A. Cutter, sales agent, successor to Cell Drier Machine Co., of Taunton, Massachusetts.

The William R. Thropp & Sons Co., which manufactures machinery of all kinds for the rubber industry, has just added a new erecting shop, 60 x 160 feet, equipped with electric traveling cranes, to its plant at Trenton, New Jersey. This company has recently put on the market a new combination calender using an electric motor for raising and lowering the rolls and in which all gears are protected by guards.

Barney Oldfield, the veteran motor racer, established a new non-stop record by winning the recent 300-mile automobile race at Venice, California, without making a single stop. His racer was equipped with Firestone tires.

A LARGE TRUCK TIRE PRESS.

THE accompanying illustration shows a truck tire press and vulcanizer capable of exerting a total pressure on the tire molds exceeding anything ever built before in this country. It has been found that no ordinary pressure would effectually operate against the pressure of the rubber in the molds. Presses with rams as large as 22 inches in diameter and with 1,500 to 1,800 pounds pressure have failed to do this work satisfactorily.



This press is built for an initial water pressure of 3,500 pounds per square inch; it has a 24-inch ram and the total pressure on the molds is approximately 800 tons. This press has a vulcanizing tank, with a clear space for molds of 10 feet, and which has been tested for a safe working pressure of 100 pounds per square inch. The press is built almost entirely of steel and weighs 98,000 pounds. With it there is used an accumulator constructed to maintain a pressure of 3,500 pounds per square inch.

Both press and accumulator are the product of the Birmingham Iron Foundry, Derby, Connecticut.

A tire repair and vulcanizing plant has been opened by the Dunbar Tire Works at 5406 Boulevard, North Bergen, New Jersey.

News of the American Rubber Trade.

THE HODGMAN RUBBER CO. TO HAVE A LARGE OFFICE BUILDING.

CONTRACTS have been given by the Hodgman Rubber Co. for the erection of a large office building 50 x 150 feet, with three stories and basement, and an extension 50 x 55 feet. This building will have all the conveniences and equipment that are known to modern office construction. It will be located in Tuckahoe, near the company's factory, and will accommodate the company's entire office force.

GUTTA PERCHA & RUBBER MANUFACTURING CO. HOLDS ANNUAL MEETING.

The Gutta Percha & Rubber Manufacturing Co., which manufactures mechanical rubber goods, having factories in Brooklyn and branches in Boston, Philadelphia, Chicago and San Francisco, as well as a New York office at 126-8 Duane street, held its annual meeting on April 9, when the following directors and officers were elected: Henry Spadone, president; Walter W. Spadone, vice-president; Alfred A. Spadone, secretary; Matthew Hawe, treasurer; all these officers together with Amedee Spadone and Charles C. Spadone being directors.

THE PEERLESS RUBBER CO. MOVES ITS NEW YORK OFFICE.

On May 1 the Peerless Rubber Manufacturing Co. moved its New York headquarters, including its executive office, sales and storerooms from 16 Warren street to 31 Warren street. While the company remains in the same location, moving practically only across the street, the change means a great deal in the way of enlarged space and increased facilities. It was only a few years ago that the company, finding its accommodations at that time inadequate, moved to 16 Warren street with the expectation that that spacious building would accommodate its growing business in mechanical rubber goods for many years to come; but the quarters, spacious as they appeared to be then, were long since outgrown. At the new address, 31 Warren street, the company occupies a large building that runs through from Warren street to the next street, affording a great deal of additional room, excellent light and a large increase in facilities for quick dispatch of business and efficient service generally.

There is no better barometer of general manufacturing conditions than active demand for mechanical rubber goods, and the fact that the Peerless company has been obliged to look for larger quarters indicates that there are a good many manufacturing plants at least that feel warranted in giving orders for renewed equipment.

CAPITAL STOCK INCREASES.

The Electric Hose & Rubber Co., of Wilmington, Delaware, has increased its capital stock from \$483,500 to \$580,200, and stockholders will be permitted to subscribe for the new shares on the basis of 20 per cent. of their present holdings. The proceeds of this \$86,700 issue will be used for extensions, improvements and additional working capital. This company has branches at New York, Philadelphia, Chicago, New Orleans and San Francisco. Its officers are: President, James Boyd; vice-president, T. Allen Hilles; secretary and treasurer, C. D. Garretson.

The Boss Rubber Co., of Denver, Colorado, has recently reorganized and increased its capitalization to \$100,000. This company was formed late in 1908, with a capital stock of \$10,000, to distribute tires. The reorganization followed the retirement of its president, John G. Boss. The present officers are: S. Z. Silversparre, president; F. P. Lilley, vice-president; Robert Rhea, secretary and treasurer. Branches have been established at Pueblo, Colorado, and El Paso, Texas.

The Turner, Vaughn & Taylor Co., engineers and manufacturers of rubber manufacturing machinery of all kinds, have increased their capital stock from \$48,000 to \$100,000.

ANNUAL STATEMENT OF THE HOOD RUBBER CO.

On February 27 last the Hood Rubber Co., of Watertown, Massachusetts, sold the balance of \$200,000 of the authorized issue of preferred stock, which was paid for in cash March 2, making the total capital issue today as follows: Common, \$2,000,000; preferred, \$2,500,000; total, \$4,500,000.

The annual statement, recently issued, shows the condition of the company on December 31, 1914. The important items are given in the condensed balance sheet shown below:

CONDENSED BALANCE SHEET.

December 31, 1914.

ASSETS.	
Plant	\$2,275,000.00
Merchandise	1,163,828.66
Accounts Receivable	3,566,985.33
Cash	209,766.10
Investments in Other Corporations	226,568.00
Patents	1,000.00
	<hr/>
	\$7,443,148.09
LIABILITIES.	
Capital Stock—Common	\$2,000,000.00
—Preferred	2,300,000.00
	<hr/>
	\$4,300,000.00
Notes Payable	1,975,000.00
Surplus	1,168,148.09
	<hr/>
	\$7,443,148.09

JACOBY CLUB.

On the evening of Thursday, April 8, an entertainment for the benefit of the Jacoby Club was held in Bates Hall, Y. M. C. A. building, Boston. This club, founded by Ernest Jacoby, is of a purely philanthropic character. As described by the founder, it is "a club for men to help themselves, by helping others." Mr. Jacoby, with the help of his efficient secretary, Mr. D. H. McFeeters, is doing an excellent and far-reaching work, with the endorsement and co-operation of the best people of Boston.

KING PRODUCTS.

The King Rubber Co., of Hyde Park, Massachusetts, is specializing in a transparent nipple of pure gum, which has already attracted considerable trade interest. Like all King products, it is attractively put up. This company also makes an extensive line of household and surgical gloves, guaranteed against oxidation, the latter standing the highest sterilization test.

RUBBER COMPANY DIVIDENDS.

The McGraw Tire & Rubber Co., of East Palestine, Ohio, on April 1 paid a regular quarterly dividend of $1\frac{3}{4}$ per cent. on its preferred stock.

The United States Rubber Co. on April 1 declared a quarterly dividend of 2 per cent. on its first preferred stock, a quarterly dividend of $1\frac{1}{2}$ per cent. on its second preferred stock and a quarterly dividend of $1\frac{1}{2}$ per cent. on common stock—payable April 15.

The Kelly-Springfield Tire Co., of Akron, Ohio, has declared a quarterly dividend of $1\frac{1}{2}$ per cent. on the common stock of the company, payable May 1 to stockholders of record on April 15.

The Firestone Tire & Rubber Co., of Akron, paid, April 15, a regular quarterly dividend of $1\frac{3}{4}$ per cent. on its preferred stock and a regular quarterly dividend of 3 per cent. on common stock.

The Miller Rubber Co., of Akron, paid, April 20, a regular quarterly dividend of $2\frac{1}{2}$ per cent. on its common stock.

The Swinehart Tire & Rubber Co., of Akron, paid, April 10, a regular quarterly dividend of $1\frac{1}{2}$ per cent.

TRADE NEWS NOTES.

A fine of \$200 to be imposed on any person convicted of placing glass, tacks or other sharp substances on the roads for the purpose of injuring tires is provided for in a bill recently introduced in the Ohio General Assembly.

The Imperial Government of Germany offers a cash prize of 100,000 marks (\$25,000) to the inventor of a satisfactory process for regenerating rubber. It also offers a prize for a material suitable for truck tires. It must, at least to a considerable extent, be immune against oil, water and acids, and for traction must possess a co-efficient of friction approaching very near to that of rubber. Solid tires alone are concerned.

The American Tire & Rubber Co., of Akron, which recently reduced its capital stock from \$500,000 to \$250,000, as mentioned on page 334 of our March issue, is now manufacturing automobile tires, its plant being equipped for a capacity up to 500 tires and 1,000 inner tubes daily. At present only the smaller sizes are being turned out, but expectations include the production of all sizes before the close of the season and the manufacture of a type of tire carrying a 4,000 mile guarantee.

The cost of the solid tire equipment necessary for the proper maintenance of a motor truck is placed by the Goodyear Tire & Rubber Co. at \$175 a year.

The Simplex Wire & Cable Co., of Boston, has recently filled an order for 2,900 feet of three-conductor, 250,000 C. M. double armored cable, placed by the J. G. White Engineering Corporation for the Down Town Mines Co., of Leadville, Colorado.

The David Feinburg Co., formerly trading as D. Feinburg Co., and dealing in rubber scrap of all kinds, has given up its offices at 138-40 Watts street, New York, and 108 A street, Boston, the present address of the company being 11 Broadway, Chelsea, Massachusetts.

The Excell Rubber Co. has purchased 3 acres of land at Wadsworth, Ohio, as a site for a tire manufacturing plant, work on which will soon be started.

The Pneumatic Tire Co., a Kentucky corporation, is soon to establish a tire factory at Madisonville, a suburb of Cincinnati, Ohio. J. D. Keith and Carl E. Glascock are the stockholders chiefly interested, and the concern is capitalized at \$100,000.

The Franklin Auto Shoe Co. has been incorporated at Pendleton, Indiana, with a capital of \$10,000, by S. W. Featherngill, William Featherngill and Thomas M. Hardy, to manufacture non-skid casings for automobile tires.

The Michelin Tire Co., of Milltown, New Jersey, has opened a branch at 1109 Walnut street, Des Moines, Iowa. R. B. Tracy, under whose direction the Chicago, Minneapolis, St. Paul and Detroit branches of this company are conducted, will also have charge of the new branch.

The Goodyear Tire & Rubber Co., of Akron, Ohio, reports a 26.6 per cent. increase in pneumatic tire output during the past year, with almost 1,500,000 tires made and sold in that period. Expectations are for a production of 2,000,000 tires during 1915. Figures showing increase in this line are given as follows: 1909, 102,669; 1910, 207,442; 1911, 332,458; 1912, 883,224; 1913, 1,139,869; 1914, 1,478,396.

This company has given its endorsement to the movement to secure a State armory for Akron by announcing that it will pay regular wages to employees who may join the National Guard, for the two weeks each year spent at encampments. The announcement states: "We consider it an example of good citizenship on the part of any man to join this body and believe he should have the moral support of all other good citizens."

The William Beckers Aniline & Chemical Works has recently purchased a tract of about 15 acres of land near Jamaica Bay, New York, for the erection of a new plant which will consist of

not less than 23 buildings. The construction work has already started.

THE RUBBER SUNDRIES ASSOCIATION MERGES WITH THE RUBBER CLUB OF AMERICA.

At the fifteenth annual meeting of the Rubber Sundries Manufacturers' Association, held on April 8, it was voted to dissolve the association as a separate organization and to make it a division of The Rubber Club of America, Inc. Mr. Russell Parker, of Parker, Stearns & Co., and Mr. Charles J. Davol, of the Davol Rubber Co., who served last year as president and vice president of the association, were elected chairman and vice chairman of the new Division. Mr. H. S. Vorhis, secretary and treasurer of the Rubber Club, was elected to the same office in the Sundries Division.

CERTAIN HOUSEHOLD ARTICLES EXEMPTED FROM RUBBER AGREEMENTS.

To an inquiry under date of March 24 by Acting Secretary of State Robert Lansing, at the suggestion of the Merchants' Association of New York, as to whether the agreements under which rubber is now allowed to leave British ports for the United States, are intended in their application to restrict the export of products, such as clothes wringers and carpet sweepers, where rubber of a poor quality plays a necessary though minor part, the British ambassador has made the following reply:

"So far as I am aware, the restriction to which you refer does not apply to the exportation to neutral countries of household utensils such as those mentioned in your letter, of which rubber forms only a fractional part."

S. SCHEIN & SONS' NEW YORK OFFICE.

S. Schein & Sons, who for the last 14 years have done a large business in waste rubber and gutta percha, with headquarters at 21 Finsbury street, London, England, and with branches in Antwerp, Paris and Cape Town, South Africa, decided, because of their increasing American business, to open branch offices in New York. Their first office in that city was opened in November, 1914, at 621 Broadway, but about the middle of April their headquarters were moved to 140 Nassau street, in order to get larger room and better facilities and for the additional purpose of getting nearer to the crude rubber and waste rubber center of the city. Their New York offices are in charge of Mr. J. S. Schein.

MR. BABCOX DELIVERS AN ADDRESS.

Edward S. Babcox, advertising manager of the Firestone Tire & Rubber Co., delivered an address at a joint banquet held by the St. Louis Accessory Association and the Advertising Club, on the evening of April 13. It was an able address, full of interesting information and valuable in its many suggestions. Mr. Babcox said that the big problem in any industry is not the question of manufacturing but of economic distribution. The work of distribution he divided between the advertising department and the traveling salesman, the efficient co-operation of these two forces being necessary for satisfactory distribution. He believed that inefficiency had been more successfully eradicated from factory management than from sales departments. As an illustration he cited an instance. "Recently," he said, "I was talking with a salesman of a certain company who told me that if he could not do all the work expected of him in two hours a day so he could have the rest of the day for his own pleasure, he would count himself no good. He was soldiering on his job and had been for months. Yet, the drag-net of the sales department in that organization had never caught him. How long would this kind of thing go on in the big factories represented here tonight?"

It would be worth while for any salesman, particularly for sales managers, to get a copy of this address, which undoubtedly the Firestone company will be glad to send on request.

SAMUEL M. NICHOLSON, DIRECTOR OF THE UNITED STATES RUBBER CO.

MRS. SAMUEL M. NICHOLSON is one of the comparatively recent additions to the United States Rubber Co.'s board of directors. He was elected for a second term at the last annual meeting held on March 16. But he is by no means a newcomer in the world of big business, for there are very few men in the country, certainly very few in New England, where Mr. Nicholson comes from, who have a wider circle of business interests. Manufacturing, banking, insurance, lighting, railroads, lumber, publishing—he's in them all.

Mr. Nicholson was born February 25, 1861, in Providence, Rhode Island, which has always been his home. Eight of his ancestors were Colonial governors of Rhode Island, so that before he was born he had a fine record in his favor. He hurried through his Latin and Greek and logarithms and at 18 was ready to go to work—which he did in the mills of the Nicholson File Co., founded by his father. He familiarized himself with the manufacturing of files, then he spent some time in the office to see how the business end was conducted and then traveled extensively in the United States and Europe in the interests of the company. In this way, the factory, the office and the market all became familiar subjects to him. In 1891 he was made vice-president of the company and two years later elected president and general manager—two positions he has held ever since.

He is also president of the American Screw Co. and a director in nearly a score of companies, including the United States Rubber Co., the Industrial Trust Co. of Providence, the Union Trust, the Narragansett Electrical Lighting Co., the Norfolk Southern Railway Co., the John I. Roper Lumber Co., the Providence Tribune Co., and others and more, besides seven insurance companies. But even so, he has never allowed business to get the upper hand—he extracts a great deal out of life besides fine annual reports. He is much devoted to yachting and belongs to the New York Yacht Club, besides several in Rhode Island. He is a member of a number of social clubs in his home section, besides the Union League and other clubs in New York City. He has also played quite a part in politics—as a member of the Providence Common Council, as Colonel on the Governor's staff; and in 1904 he was one of the presidential electors who voted to give Mr. Roosevelt four years in the White House.

The Schall Rubber Co., of Huntington, Indiana, is preparing plans for the enlargement of its plant.

The Whitall Fatum Co., which manufactures rubber sundries for the drug store trade, is making extensive additions to the equipment of its factory at Keyport, New Jersey, the press department equipment being more than doubled.



SAMUEL M. NICHOLSON.

PERSONAL MENTION.

Horace L. Dawson has been promoted to the district sales management in the Chicago territory for The Cutler-Hammer Clutch Co., of Milwaukee, manufacturers of the magnetic clutch-brake equipment for rubber mills. Mr. Dawson became associated with the Cutler-Hammer company in 1907, immediately after his graduation from Cornell. When the company opened its Cincinnati office, in 1913, he was placed in charge.

Nicholas F. Brady, a member of the board of directors of the United States Rubber Co., is one of the eight members of the Finance Committee of The National Security League, Inc., an organization formed to promote plans to adequately prepare the United States for defence. Membership in this League—which is located at 25 Pine street, New York—is divided into three classes, life, contributing and annual, with dues of \$25, \$5 and \$1, respectively.

S. P. Woodard has been appointed sales manager of the New Jersey Car Spring & Rubber Co., of Jersey City, New Jersey.

C. E. Speaks has been appointed manager of the motorcycle tire department of the Firestone Tire & Rubber Co., of Akron, Ohio.

Benjamin F. Hochschild, of Chicago, was elected on March 1 to the office of president and general manager of The Gordon Rubber Co., of Canton, Ohio, formerly held by A. E. Gordon.

Joel Mann Martin, for the past five or six years Atlanta manager for the Banner Electric division of the General Electric Co., on April 5 entered the employ of the Walpole Tire & Rubber Co., of Walpole, Massachusetts, as Southern representative, handling Walpole tapes and insulating varnishes.

Jacques Reismann, of Manaos, Brazil, arrived in New York April 12, by the Lloyd Brasileiro steamship "Sao Paulo." Mr. Reismann, who is a prominent merchant and importer of supplies, numbering among his customers some of the best-known rubber men of the Upper Amazon and the Acre district, expects to remain in the United States for two or three months.

Henry H. Holland, manager of the London office of the United States Rubber Co., is paying his annual visit to the United States.

C. E. Siegfried has established offices in the Hamilton building, Akron, Ohio, where he will act as Western agent for George E. Pell, crude rubber broker, of New York.

E. D. Hartman has been entrusted with the management of the branch just opened in Washington, D. C., at 1313 New York avenue, by the Fisk Rubber Co., with whose Baltimore branch he was connected for several years.

Thomas A. Bennett, for the past five years in charge of the conveyor and elevator belt sales of The B. F. Goodrich Co., at Akron, has become associated with the New Jersey Zinc Co., in New York, as assistant to the general sales manager.

Frederick J. Redemann has been promoted from the management of the Worcester, Massachusetts, branch of the Goodyear Tire & Rubber Co., to the position of manager of the branch at Hartford, Connecticut. He is succeeded in Worcester by E. T. Ramey.

J. B. Fry, who was for five years in the employ of the United States Navy, as a rubber expert, has been appointed manager of the Detroit branch of the Empire Rubber & Tire Co., of Trenton, New Jersey, with an office at 842 Woodward avenue.

The latest handicap list of the Metropolitan Golf Association, issued April 10, includes among its 553 names that of Russell G. Colt.

Charles A. Coe, manager of the Boston office of the United States Rubber Co., has had an attack of pneumonia but, it is pleasant to record, is now convalescing.

THE LATEST ARRIVAL IN THE CANADIAN RUBBER TRADE.

The latest addition to official circles in the rubber trade of Canada is John William Henderson Miner, son of Vice-President William H. Miner, of the Miner Rubber Co., Limited, of Granby, Quebec. The young man reached Granby on March 11, in good health, and registering 8 pounds.

MR. F. J. GLEASON JOINS THE STANDARD COMPANY.

Frederick J. Gleason, who for a number of years has been connected with the Walpole Tire & Rubber Co. as vice-president and general superintendent, has left that organization to become director and general superintendent of the Standard Woven Fabric Co., of Framingham, Massachusetts. Mr. Gleason is well known as the originator and for a score of years the producer of the products of the Massachusetts Chemical Co. His knowledge of friction materials and insulating compounds comes from long experience in these lines, and he will prove a valuable addition to the Standard organization. Mr. Gleason has not only been prominent in rubber circles, but for years he took a leading part in the civic affairs of Walpole, where he was for some time president of the Board of Trade and of the Walpole Co-operative Bank.

MR. A. H. MARKS BUYS A YACHT.

Arthur H. Marks, vice-president of The B. F. Goodrich Co., has recently purchased the steel twin-screw cruising gasoline yacht, the "Joyeuse." This yacht is one of the largest gasoline yachts which will be seen in Eastern waters during the coming season. It is 98 feet over all, 16 feet beam, draws 5 feet and was built in 1910. It has a speed of from 14 to 16 miles an hour. Mr. Marks is a member of the Eastern Yacht Club and has a summer home at Marblehead, Massachusetts, where the yacht will be taken after the outfitting now being done at Camden, New Jersey, is completed.

THE BRITISH GOVERNMENT THANKS COMMODORE BENEDICT.

The March number of this publication contained a mention of Commodore Benedict's rescue in West Indian waters of an English sloop a few weeks earlier. The commodore reached New York on April 9, after an 8,000-mile voyage on his yacht the "Oneida," and on arriving at port he was presented by the State Department with a letter from the British ambassador conveying to the commodore an expression of the warmest appreciation on the part of the British government of his rescue of the "Southern Cross" early in February.

When the commodore's yacht reached Antigua news had just been received of the wrecking of the "Southern Cross" in neighboring waters, but there was no steamship available for rescue. The commodore instantly volunteered and set sail for the scene of the wreck. He rescued all the crew and passengers, including the acting commissioner of Montserrat, and towed the disabled sloop into port.

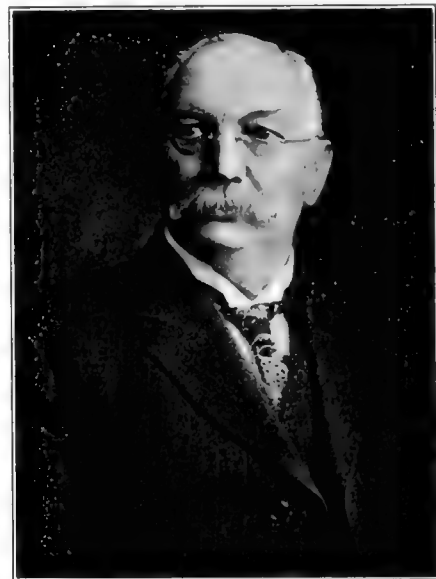
The Commodore expects to visit the Pacific Coast very soon, to be gone about six weeks, accompanied by his two daughters, Mrs. C. B. Harmon and Mrs. Ramsey Turnbull. He will spend some time at the Panama-Pacific Exposition in his capacity as Yachting Commissioner for the State of Connecticut.

MR. BARNES ASSISTANT TO MANAGER OF SALES.

Charles W. Barnes has recently been appointed assistant to the manager of sales of the United States Rubber Co. Mr. Barnes has been connected with the selling department of the United States Rubber Co. ever since the formation of that corporation and carries the thousands of details of the making and distribution of rubber boots, shoes and tennis comfortably under his hat. For a number of years he was connected with the company's Boston office, but, on the theory that nothing was too good for headquarters, he was brought over to New York about a dozen years ago.

PRESIDENT McKECHNIE OF THE CANADIAN CONSOLIDATED.

J. H. McKECHNIE, who on April 6 was elected president of the Canadian Consolidated Rubber Co., Limited, of Montreal, began his rubber activities close to 40 years ago. He was interested at that time in a saw mill in a small town not far from Granby, Quebec, and he went to Montreal to arrange for the purchase of rubber belting for use in the mill. While there he visited the Goodyear store and noticed a large volume of gossamer coats made by the Goodyear company in the States. He not only got his belting but he got a suggestion, and shortly after returning to Granby he started a factory for making gossamer coats. That was in 1877. But the demand for gossamer coats soon decreased everywhere, and then Mr. McKechnie, together with the late Mr. Miner, started the Granby Rubber Co. for the manufacture of rubber footwear. This corporation, as everyone in the trade knows, was a very successful one and had built up a large and profitable trade when it was merged with the Canadian Consolidated Rubber Co., Limited. Soon after this merger Mr. McKechnie was made vice-president of the consolidated company, and he continued to occupy that position until the withdrawal, at the last annual meeting, of D. Lorne McGibbon as president, when Mr. McKechnie was elected his successor.



J. H. McKECHNIE.

AN INTERESTING ARTICLE BY A. H. ALDEN.

Adelbert H. Alden is the author of a very interesting essay entitled "An American Point of View," published in "The Westminster Gazette," London, for March 19. The article deals very thoroughly with the present American unpreparedness for war. Then it contrasts the unarmed Republic and the armed Empire in their ability to defend their liberties. A very interesting portion of the paper is devoted to an exposition of the subconscious creation of public opinion, particularly in the United States.

CONDITIONS IN MEXICO.

Clarence Harvey, son of the late J. C. Harvey, of Mexico, was recently in New York. He reports that all of the rubber plantations in the state of Veracruz and Oaxaca are practically abandoned. Roving bands of soldiers infest the whole country and the Americans and English who were in charge of the estates have gone to Mexico City or left the country. He is now visiting his mother in Los Angeles, and plans to return to the plantation—La Buena Ventura—in June, if it is possible, to recover the fine orchids collected by his father.

MR. HEWINS IN LONDON.

During the early part of last month, E. D. Hewins, the well-known distributor of cotton ducks and fabrics adapted to various purposes in the manufacture of different types of rubber goods and tires, sailed for London, in the interest of his business. Mr. Hewins will visit various parts of England as well as Scotland.

TRADE NEWS NOTES.

The Manhattan Rubber Manufacturing Co., on or about May 1, will remove its New York office from 18 Vesey street to the sixteenth floor of the Equitable building, 120 Broadway.

Johnstone, Whitworth & Co., importers of crude rubber, have removed their offices from 130 Pearl street, New York, to 22-24 William street, in the Farmers' Loan & Trust building.

The Detroit branch of the Pennsylvania Rubber Co., of Jeanette, Pennsylvania, has removed from 864 Woodward avenue to 254 Jefferson avenue.

The Warner Chemical Co., of Carteret, New Jersey, which manufactures sulphur chloride, tetra-chloride of carbon and other chemicals for the rubber trade, has moved its New York offices and sales department from 141 Broadway to 52 Vanderbilt avenue.

Three of the men formerly connected with the Knight Tire & Rubber Co., of Canton, Ohio, have recently joined the McNaull Tire & Rubber Co., of Toledo, Ohio. They are Ole Hilner, formerly sales manager for the Knight company, who now occupies the same position in the McNaull company; P. P. Parker, who was formerly assistant manager of the Knight company, and who now becomes Eastern district manager of the McNaull company, and Thomas Gray, who was Southern district manager for the Knight company, and who has taken a similar position in the McNaull company.

A new tri-car chemical fire engine has just been brought out in New York by the Woodhouse Manufacturing Co. This machine is supplied with Dayton airless tires and carries 200 feet of 3/4-inch chemical hose.

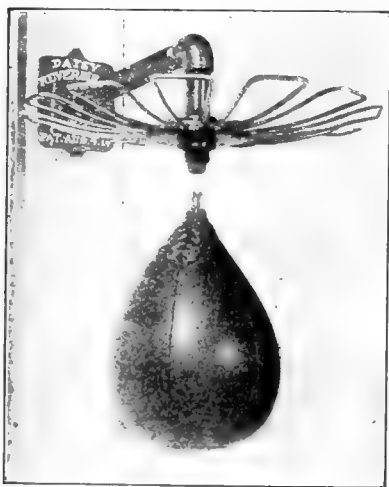
NILES & GOODSELL INCORPORATE.

The partnership of Niles & Goodell, under which business was formerly conducted at 84 Reade street, New York, has been taken over by the firm of Niles & Goodell, Inc., with offices at 142 Duane street. The officers of the new firm—which was incorporated April 6, with a capital stock of \$10,000, and which acts as selling agents for the Converse Rubber Shoe Co., of Malden, Massachusetts, in eastern New York and Pennsylvania, New Jersey, Delaware, Maryland and West Virginia—are: F. R. Goodell, president; C. W. Niles, Jr., vice-president and treasurer, and H. M. Alexander, secretary.

AN IMPROVED HOME EXERCISER.

Among the apparatus recommended by experts as a practical and effective form of physical exercise, by means of which the entire muscular system is subjected to healthful exertion, the striking bag holds a conspicuous place.

The objection made to its use in the home is the noise and vibration it causes and it is in these respects that improvements are claimed for the striking bag platform patented by a boxing instructor in Brooklyn. As the illustration shows, it is equipped with an arrangement of spring arms or buffers, which obviates the drum effect of the ordinary form of construction.



This platform is also reversible, the disposition of the steel arms, which can be directed upward or downward, making it a fast or slow speed bag, without changing the inflation. The ease with which it can be installed or removed is also

urged by the inventor, who is also the manufacturer. [George Yoerger, Brooklyn, New York.]

LATE RUBBER CUSTOM'S RULINGS.

The Board of General Appraisers passed on two questions of rubber customs on April 28, which will be of interest to the trade. The first case had to do with the importation of "rubber thorns" intended for use in making artificial flowers. The collector had decided that these were dutiable at 60 per cent. ad valorem as parts of artificial flowers. The importers, the Edwards & Riodan Co., contended that they should come in at 10 per cent. as manufactures of rubber, but the board overruled this contention and sustained the Collector.

The other protest was made by the Hanover Vulcanite Co., which imported rubber bulbs. The Collector had returned this merchandise at 15 per cent. ad valorem. The importers contended that the rate should be 10 per cent. under the rubber manufactures' division. This contention was allowed and the Collector reversed.

MR. ROCKEFELLER RELIES ON RUBBER.

TO be sure the average American has reached the philosophic plane where mere money, even when measured by millions, makes no perceptible appeal. Still, when a man is reputed to be the richest man that ever lived, one cannot help but

feel something of a friendly interest in him. Now here is a photograph of the man who enjoys that reputation. There are two noticeable features about this picture. One is that, while enjoying an income of, let us say, fifty millions a year—which would enable him to have a "Ford" and even a chauffeur—he still clings to the bicycle for his daily outing, which wholesome enjoyment would be denied him were it not for the rubber



JOHN D. ROCKEFELLER.

pneumatic tire around the wheel. The other noticeable feature of this interesting photograph is the fact that Mr. Rockefeller has his feet well protected in a pair of storm rubbers, though at the time the snap shot was taken there does not appear to have been any storm. But undoubtedly the grass was wet; hence the richest man in the world, using in personal matters the same exceptional sagacity which he has employed in business affairs, duly protected his feet.

So this momentary glimpse into the intimate life of a billionaire shows how much he relies upon rubber both for his enjoyment and for the preservation of his health.

TRADE NEWS NOTES.

The Pennsylvania Rubber Co. has reduced the prices of its inner tubes 10 per cent. This reduction, which applies to all the company's brands: "Puregum Red," "Pennsylvania Gray" and "Nugray," was made possible by the increased manufacturing facilities afforded by the company's new plant at Jeannette, Pennsylvania.

The McGraw Tire & Rubber Co., of East Palestine, Ohio, has opened a branch store at 737 Main street, Buffalo, New York, for the sale of its pneumatic tires, inner tubes and solid truck tires.

The plant and business of the Century Rubber Co., of Plainfield, New Jersey, will be sold at public auction on May 21 at the premises of the company. Conditions of the sale may be obtained from the receiver, Frank P. McDermott, 75 Montgomery street, Jersey City. A certified check for \$5,000 must accompany each offer, and the successful bidder will be required to deposit 10 per cent. of the purchase price in cash.

The two small dirigibles—175 feet in length—on which the Navy Department recently asked bids, are to be used in experimental work and for training purposes at the aviation school at Pensacola, Florida.

Model aeroplane contests are being held at Concord, Massachusetts, under the direction of Edward P. Warner, of that city. These contests are open to boys operating model aeroplanes driven by rubber bands. Silver and bronze medals are to be awarded.

The Wilson Tire & Rubber Co. is installing machinery in its plant at Springfield, Illinois, and hopes by the middle of May to commence manufacturing; its product to consist of the Wilson puncture-proof pneumatic tire and demountable rim illustrated and described on page 142 of our issue of December, 1913.

Records of production by the Goodyear Tire & Rubber Co., of Akron, show that during March 1,000,000 feet of hose—including all varieties—was turned out by that concern, breaking all previous records of its mechanical goods department.

The truck tire department of the Republic Rubber Co., of Youngstown, Ohio, is reported working overtime on orders for tires for foreign commercial use.

The National Double Tire Co., incorporated at St. Louis, with a capital stock of \$16,000, by William Geist, George W. Milius and Adolph Schlesinger, is seeking equipment for a plant to manufacture automobile tires and accessories.

The Hil-Ko Rim Lock Co., of which Frank D. Hiller is president, expects soon to establish a factory for the manufacture of rim locks. The present office of the company is in the Railway Exchange building, St. Louis, Missouri.

The Falls Rubber Co., of Cuyahoga Falls, Ohio, recently purchased additional property on which to erect a new factory building and power house. Excavation work is now nearly completed and contracts are being let for the construction of the plant, which is to be completed by September 1. This addition will be 80 x 200 feet, three stories high.

Balloon racing is to be a feature of the season's sports. The Aero Club of New England is arranging a balloon pursuit contest, to take place in May in Worcester, Massachusetts, and the Aero Club of Pennsylvania plans a similar contest for Philadelphia. At Pittsfield, Massachusetts, where a balloon race was held last October, a trophy has been put up by the president of the Aero Club of America for an annual contest. The "Dancing Doll," operated by Leo Stevens, will be used at the Pittsfield meet again this year as the "king" balloon to lead the pursuit.

The Rome Wire Co., which manufactures insulated and other electrical wires, is building a small addition, 40 x 75 feet, to its plant at Rome, New York.

MORE MILEAGE RECORDS.

The March number of "Staggard," the interesting house organ of the Republic Rubber Co., of Youngstown, Ohio, contains a record of a Staggard casing that has been run for 30,000 miles without ever being off the rim; also a record of 16,176 miles' service given by another Staggard tire, which is still being carried for emergency use.

ASSOCIATION MEETINGS, EXPOSITIONS, ETC.

The American Cotton Manufacturers' Association held its annual meeting, April 13 to 14, at Memphis, Tennessee.

The National Association of Cotton Manufacturers held its annual meeting, April 28 to 29, at Boston.

The National Association of Manufacturers will hold its twentieth annual meeting, May 18 to 19, at the Waldorf-Astoria, New York.

The American Society for Testing Materials will hold its regular annual meeting, June 22 to 26, at the Hotel Traymore, Atlantic City.

The annual meeting of the American Automobile Association will be held, May 18 to 19, at Boston.

The annual Electrical Exposition and Motor Show will be held, October 6 to 16, at the Grand Central Palace, New York.

The nineteenth annual meeting of the National Fire Protection Association will be held May 11-13 at the Hotel Astor, New York.

S. A. E. STANDARDS COMMITTEE MEETING.

The Standards Committee of the Society of Automobile Engineers held its spring meeting in the new offices of the society in the Bayer building, Detroit, on April 22. Several other divisions of the S. A. E. held meetings the same day in Detroit. The meeting of the Standards Committee extended throughout the day and reports were received from the several divisions and sub-committees of the association. This committee is made up of 150 designers and manufacturers of automobiles and automobile parts, and it is divided into 14 divisions and sub-committees of which 11 submitted reports at this meeting.

The practices and standards which the S. A. E. has from time to time recommended have been of great help to the automobile and allied industries in reducing and simplifying the work of the various departments of these industries through the creation of standards which have been readily adopted. For instance, before the advice of the S. A. E. was heeded, wheel manufacturers were obliged to make wheels to fit each individual band, and for each make of tire a different width was required. It is said that the adoption of the S. A. E. standards has reduced the price of motor truck wheels by 20 per cent.

RECEIVER APPOINTED FOR SAFETY TIRE & TREAD CO.

Upon the application of creditors and stockholders, a receiver has been appointed for the Safety Tire & Tread Co., which has been operating a small plant in Harrison, New Jersey, appraised at about \$2,000. Charles Vail, president of the company and the man chiefly responsible for its organization, who has maintained offices at 29 Broadway, New York, is reported to have disappeared. According to charges filed in the Federal Court of Jersey City, the outstanding capital stock of the company is \$42,000, of which amount \$25,000 represents payment for a secret process which Vail claimed to control for making new tires out of old, and which the petitioners charge existed only in imagination, while liabilities other than stock subscriptions are estimated at \$4,500; there are not visible assets, the stock and equipment of the Harrison factory having been removed some time ago; about \$8,000 in cash was paid into the company's treasury last September by stockholders, and the largest individual loser is H. Q. Foreman, who is reported to have invested \$4,000 in stock and to have later loaned the company \$500 in cash.

NEW INCORPORATIONS.

A. L. A. Tire Co., March 19, 1915; under the laws of Delaware; authorized capital, \$500,000. Incorporators: Charles B. Bishop, Clarence J. Jacobs and Harry W. Davis—all of Wilmington, Delaware. To purchase, sell and deal in and with all kinds of supplies, tools, accessories, etc., in use or incidental to automobiles, motor trucks, etc.

Adams & Co., Inc., Louis R., April 20, 1915; under the laws of New York; authorized capital, \$5,000. Incorporators: Louis R. Adams and Mary B. Adams—both of Rowayton, Connecticut, and Harry W. Soul, 143 Tibbetts road, Yonkers, New York. To manufacture tires, rims, etc.

Anthony Rubber Manufacturing Co., April 1, 1915; under the laws of Rhode Island; authorized capital, \$100,000, of which \$90,000 is to be common and \$10,000 preferred. Incorporators: John Anthony, Attleboro, Massachusetts; Frank Healey and George T. Marsh—both of Providence, Rhode Island. To buy, sell and deal in crude rubber and rubber goods and for the manufacture of rubber goods, tires, rubber belting, etc.

Armour Tread Co., March 17, 1915; under the laws of Connecticut; authorized capital, \$25,000. Incorporators: John A. Thomas, Albany, and Charles H. Sims, Corinth—both in New York—and Monroe J. Brewer, East Hartford, Connecticut. To manufacture automobile treads and tires.

Baker Co., Charles, March 9, 1915; under the laws of Massachusetts; authorized capital, \$50,000. Incorporators: Charles Baker, 29 Pinckney road; Walter Hartstone, 15 Orkney road, and David A. Marshall, 6 Hartwell street—all in Boston. To deal in rubber, etc., and to manufacture clothing, garments and wearing apparel from said article.

Brown Tube Distributing Co., Inc., March 30, 1915; under the laws of New York; authorized capital, \$25,000. Incorporators: Floyd L. Smith and Loyal F. Smith—both of 63 Broad street, Plattsburg, New York—and Charles S. Averill, Hotel Bancroft, Worcester, Massachusetts. To market the "Brown Perfection Tube," etc.

C. C. C. Fire Hose Co., The, March 25, 1915; under the laws of Maine; authorized capital, \$50,000. Incorporators: Ernest E. Noble (president), E. V. Mann (treasurer), and Frederick Hale (clerk)—all of Portland, Maine. To manufacture, sell, buy, import and deal in fire hose and other rubber goods.

Chic-Mint Gum Co., March 25, 1915; under the laws of Delaware; authorized capital, \$100,000. Incorporators: F. D. Buck, George W. Dillman and M. L. Harty—all of Wilmington, Delaware. To manufacture chewing gum.

Elyria Tire & Rubber Co., The, March 6, 1915; under the laws of Ohio; authorized capital, \$250,000. Incorporators: Alexander G. Snow, Edward P. Parshall, Gust. G. Gilbert, Carl W. Neubrand and James L. Lind. To manufacture rubber goods, etc.

Famous Tire & Rubber Co., Inc., April 12, 1915; under the laws of New York; authorized capital, \$15,000. Incorporators: Emanuel Newman, William R. Jackson and William A. Ihne—all of 391 Fulton street, Brooklyn, New York. Tire business.

Franklin Auto Shoe Co., March 25, 1915; under the laws of Indiana; authorized capital, \$10,000. Incorporators: William Featherngill, S. W. Featherngill, and Thomas M. Hardy. To manufacture a patent auto shoe.

Guelph Tire & Rubber Co., Limited, March 31, 1915; under the laws of Canada; authorized capital, \$350,000—4,000 common shares of \$25 each, 5,000 preferred shares of \$50 each. Incorporators: Alexander Henry Davidson, Southampton; Thomas Nairn Dunn, Strathroy; Archibald Orr, Gideon Grant, John Henry Legge Patterson, Frank Dyche Law—all of Toronto—and Christian Roth Miller, Berlin—both in Ontario, Canada. To manufacture rubber goods.

Keene Shock Absorber Co., The, March 29, 1915; under the laws of New Jersey; authorized capital, \$125,000. Incorporators: George A. Keene, Peter E. Wurfflein and A. Dayton Oliphant—

all of Trenton, New Jersey. Principal office, Room 805, American Mechanic Building, 137 East State street, Trenton, New Jersey. To purchase or acquire the letters patent of the United States of America granted to George Olsen, covering the manufacture of shock absorbers for heels and arches.

Kurtz-Pincus Co., Inc., March 25, 1915; under the laws of New York; authorized capital, \$10,000. Incorporators: Harry Pincus, 180 Ashland avenue; Nathan Kurtz and Ella P. Kurtz—both of 115 Claremont avenue—all in Buffalo, New York. To deal in waste, scrap rubber, etc.

Niles & Goodell, Inc., April 6, 1915; under the laws of New York; authorized capital, \$10,000. Incorporators: Charles W. Niles, Jr., 53 Pineapple street; Frank R. Goodell, 170 Woodruff avenue—both in Brooklyn, New York—and Howard M. Alexander, Newark, New Jersey. To manufacture footwear, rubbers and rubber goods.

Paramount Rubber Products Co. of New York, Inc., April 13, 1915; under the laws of New York; authorized capital, \$1,000. Incorporators: Blanche V. Bacon, William F. Bacon and Emma B. Becker—all of Waterloo, New York. To manufacture rubber goods of all kinds.

Royal Tire & Rubber Co., The, March 27, 1915; under the laws of New Jersey; authorized capital, \$125,000. Incorporators: Wallace D. Fuerth, 7 Howard street; Bernard C. Cohn, 66 Elliott street, and David Fuerth, 7 Howard street—all in Newark, New Jersey. To manufacture and sell at wholesale and retail automobile tires, inner tubes, and all other automobile supplies and accessories.

Rubber Regenerating Co., Limited, The, March 22, 1915; under the laws of Canada; authorized capital, \$200,000—2,000 shares of \$100 each. Incorporators: Charles Macpherson Hold, Errol Malcolm McDougall, Gilbert Sutherland Stairs, Pierre Francois Casgrain and John Buchanan Henderson—all of Montreal, Quebec. To manufacture rubber goods of various kinds.

Self Sealing Inner Tube Co., April 10, 1915; under the laws of Delaware; authorized capital, \$125,000. Incorporators: Carl Van der Voort, L. C. Rowland, F. M. Casey—all of Pittsburgh, Pennsylvania. To manufacture and sell automobile tire tubes, tires, automobile accessories and rubber goods of all kinds.

Ullman & Solomon, Inc., April 5, 1915; under the laws of New York; authorized capital, \$25,000. Incorporators: David Solomon, 839 West End avenue; Stuart M. Kohn, 440 Riverside Drive—both in New York City—and Herman V. Ullman, 6037 St. Lawrence avenue, Chicago. To manufacture raincoats and other apparel.

Walsh Tire & Rubber Co., April 14, 1915; under the laws of Delaware; authorized capital, \$100,000. Incorporators: F. R. Hansell, Philadelphia, and George H. B. Martin and S. C. Seymour, of Camden, New Jersey. To manufacture, buy, sell and deal in tires, automobiles, etc.

Washington Rubber Bag Co., Inc., April 12, 1915; under the laws of New York; authorized capital, \$1,000. Incorporators: Israel Scolnik and Joseph Scolnik—both of 1359 Clay avenue, and Sigmund Spielberger, 43 Second avenue—all in New York City. To manufacture bathing bags, etc.

White Manufacturing Co., The, March 31, 1915; under the laws of Ohio; authorized capital, \$10,000, divided into 100 shares of \$100 each. Incorporators: I. J. Cooper, W. L. Busch, Wilson C. Latta, A. H. Apking and F. W. Cooper. To manufacture rubber goods.

The Columbia Tire & Rubber Co., formation of which was mentioned on page 397 of our April issue, has elected its officers and directors. Charles Hoffman has been elected president; W. G. Henne, vice-president and general manager; Jesse E. LaDow, secretary, and Walter F. Henne, treasurer. The board of directors is composed of these officers, together with J. C. Henne, William Islay and J. E. Schauer.

TRADE NEWS NOTES.

The Fisk tire, made by the Fisk Rubber Co., of Chicopee Falls, Massachusetts, was displayed at the auto show held at Phoenix, Arizona, late in March, an agency for its sale having been established in that city, with the Kenyon Tire Supply Co. The Fisk company has also established a direct factory branch in Salt Lake City, Utah, at 163 East Broadway.

The Warner Rubber Co., of 68 Huntington avenue, Boston, distributors of the Quaker tire, made by the Quaker City Rubber Co., of Philadelphia, has taken over and will continue the tire and accessory business of the Back Bay Motor Supply Co., located at the same address.

The Milwaukee Tire & Rubber Co. has taken an agency for the State of Wisconsin and part of Michigan for the sale of Marathon tires, made by The Marathon Tire & Rubber Co., of Cuyahoga Falls, Ohio. L. J. Engel and J. J. Griffin, who compose the firm, were both formerly with the Standard Racine Rubber Co. The headquarters of the company are at 456 Milwaukee street, Milwaukee.

The Kelly-Springfield Tire Co., of Akron, Ohio, has opened a factory branch at Dallas, Texas, in charge of H. L. Smith.

The Dreadnaught Tire & Rubber Co., of Baltimore, which recently installed a new mill, is at present working on the foundation of a vulcanizer, which will increase the number to four. It is stated by the management that both equipment and floor space will soon be further increased.

The Maibohm Rubber Co., now in process of organization at Chicago, contemplates the erection of a plant in that city for the manufacture of a new type of non-skid tire on which a patent has recently been secured.

The plant of the Parker Hammerton Manufacturing Co., at Saugus, Massachusetts, was considerably damaged early in April by the explosion of dynamite in work of excavating for a garage foundation on a site across the street from the factory. Rocks—some of them weighing, it is said, from 200 to 300 pounds—were hurled through the side of the factory, where 60 operatives were at work, every window in that side of the building being broken.

The sale of the Walpole Tire & Rubber Co., of Walpole, Massachusetts, to a committee of New York creditors—which has been pending for several weeks—was confirmed by the federal court on April 12. Shareholders of the company who offered \$20,000 over the price at which this property was sold at auction have given notice that they will appeal from the decree of confirmation.

The Royal Tire & Rubber Co., whose main office and sales-rooms are located at 267 Halsey street, Newark, New Jersey, has commenced the manufacture of automobile and motorcycle tires and tubes at a factory in Brooklyn, New York. The brand "Royal" will be applied to the first products of the factory, later manufactures to be made under special brands.

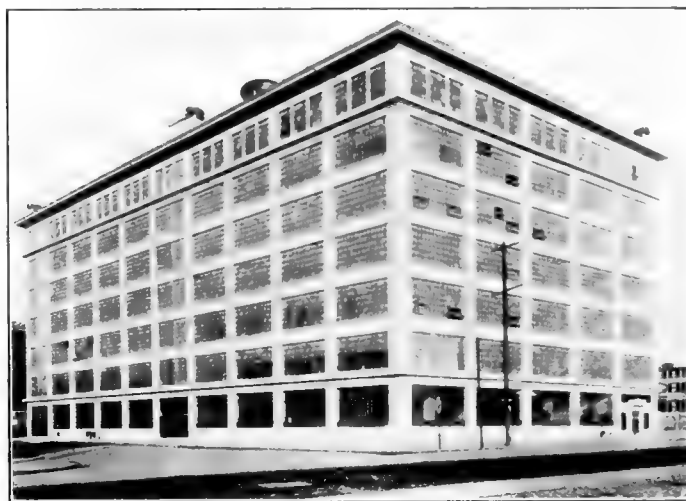
A factory has been purchased at Mt. Clemens, Michigan, by the Auto Tire Armor Co., for the manufacture of automobile tires, and equipment is being installed. This company, of which Jay Baldwin and A. A. Bennett are the principal stockholders, is capitalized at \$10,000.

The Alling Rubber Co., of Springfield, Massachusetts, recently instituted a novel contest among the school children of that city, in which prizes were awarded in the form of raincoats, gloves and rubbers. Each child was invited to designate, in a statement of 20 words, the best way to locate the Alling rubber store so that everyone who read the company's advertisement would know just where to go, prizes being given for the best replies.

A MODEL BROOKLYN PLANT

OCCUPYING an entire block on Atlantic avenue, Brooklyn, and proportionate territory on two connecting streets, stands the imposing gray stone plant of A. Schrader's Son, Inc., manufacturers of the well-known Schrader tire valve, tire gage, dust cap and valve tool. In addition to these valuable and widely-distributed devices, this company makes the diving apparatus in use by the United States Government, and naturally recognized as standard.

The factory is of steel construction throughout and absolutely fireproof, in addition to which, by way of "making assurance



PLANT OF A. SCHRADER'S SON, INC.

doubly sure," each floor is equipped with an automatic sprinkler system. The front entrance, on Atlantic avenue, and the stairway leading to the first floor are of bronze, giving an exceedingly artistic and substantial effect. Connected with the main factory building is a large garage and automobile repair shop, which houses the two large electric trucks and the various motor cars in use by factory officials.

The power plant, which includes a complete electric equipment, is modern in every respect and has an automatic coal-handling and ash-disbursing system. The power plant reflects, as does every other department, a carefully conceived theory of the highest efficiency at the smallest cost.

The offices are light and commodious, accommodating a large staff and a very busy one. The various departments of manufacturing, assembling, shipping and receiving are always working full capacity. The company has in its employ practically a thousand people, for whose convenience and welfare every provision has been made. Among the facilities for the promotion of the comfort and health of the employees are two large and well-appointed lunchrooms, a thoroughly appointed hospital department, with nurse in attendance, and the provision of umbrellas during inclement weather, as well as a supply of dry stockings for the young women in case of wet feet. Libraries and reading rooms are also provided and open to use by employees.

The manager of this plant and the man to whose genius and kindness this model factory and these agreeable conditions are due, is M. C. Schweinert, who is favorably known to tire manufacturers, not only in this country but in England as well, where the company has a very large plant.

THE PIONEER ASPHALT CO.

The old American Asphaltum & Rubber Co. has been re-organized under the name of The Pioneer Asphalt Co., which will resume the manufacture of "Pioneer M. R." at the mills in Lawrenceville, Illinois, formerly occupied by the American company.

THE NEW JERSEY CAR SPRING & RUBBER CO.

IN 1858 the late John J. Fields established a company under the title of the Elastic Cone Spring Co., on Cortlandt street, in New York city, for the manufacture of rubber car springs, which at that time had come into very general use. Within a few years, however, the spiral coil steel spring was invented, and this gradually displaced the rubber car springs, compelling the Elastic Cone Spring Co. to devote its attention to other lines of manufacture. It moved over to Jersey City and a little later was re-incorporated under the name of the New Jersey Car Spring & Rubber Co., under which name it has continued doing business up to the present time.

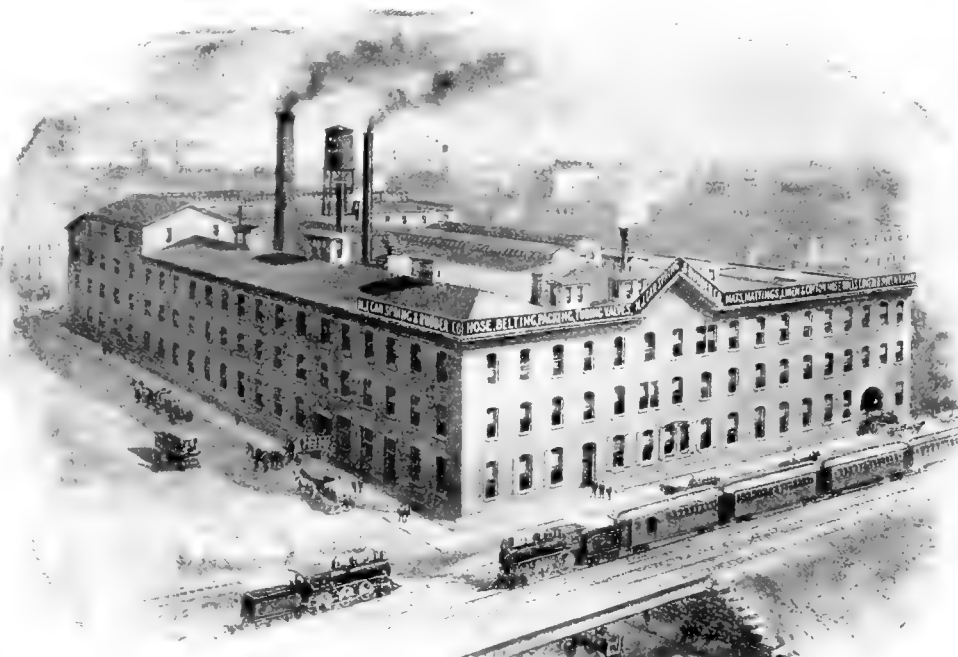
After the rubber car spring had practically gone out of use the company began the manufacture of sheet packing, valves and other molded articles. Then it added a hose department, later a belting department, and finally branched out into the general

manufacture of mechanical rubber goods, including belting for transmission, conveyor and elevator use. About five years ago it added an automobile tire department to its already extensive lines, and it has met with excellent success in this new department. That the company's products are of the permanently satisfying kind is proved by the fact that it has many accounts on its books that have been there for 20 years and over.

The present officers of the company, all of whom are active in its management, are as follows: President, John J. Fields; vice-president, George B. Dickerson; treasurer, Townsend Coker; secretary, George E. Jeandheur; assistant treasurer, John J. Fields, 3rd.

The company's works and main office are still in Jersey City, where they were established 50 years ago; and, in addition, it has branches in New York, Philadelphia, Pittsburgh, Cleveland, Chicago

and Los Angeles, with distributing centers in almost all of the principal cities of the country.



PLANT OF THE NEW JERSEY CAR SPRING & RUBBER CO.

THE R. J. CALDWELL CO. WINS ITS SUIT.

The R. J. Caldwell Co., of New York, won the suit which it recently brought in the Supreme Court, Kennebec County, Maine, against the Cushnoc Paper Co., of Augusta, that State. The Caldwell company sued the defendant for breach of contract, in failing to pay for a number of dryer felts, which the defendant admitted having received. The paper company cited by way of defense that the plaintiff had failed to keep its part of the contract, but the jury, after brief deliberation, brought in a verdict for the Caldwell company against the local corporation.

SWINEHART FACTORY ADDITION.

The Swinehart Tire & Rubber Co. is adding a three-story steel and brick building, 122 x 105 feet, to its plant at Akron, Ohio, which it expects to have ready for occupancy by the first of July. This building will be used for the extension of the pneumatic and truck tire departments, which are to be located on the first and second floors, and for the company's general offices, which will be on the third floor. In it will also be located a new and up-to-date hospital, as well as rest rooms for the employees. The addition to the line of a demountable and pressed-on type truck tire for heavy duty trucks, made in both the cellular and plain tread styles, is responsible in part for these changes.

A JOBBING HOUSE ENTERS THE FIELD OF MANUFACTURES.

Negotiations are reported pending between The Independent Rubber Co., of Akron, and the Chamber of Commerce, of Barberton, Ohio, for the establishment of a tire manufacturing industry in the latter city. The Independent company, at present

engaged in the jobbing business, has announced its intention of entering the manufacturing field, and if satisfactory arrangements can be made, would occupy the old factory of the Summit Rubber Co., at Barberton. These arrangements include a \$30,000 subscription by the Trade Board to the stock of the company.

FRAUD AND CONSPIRACY ALLEGED.

William A. Ellis, president of the Ellis-Ward Co., of 817 Boylston street, Boston, dealers in rubber tire goods, and Elsie G. Morehouse, acting treasurer of the company, are under indictment in Boston—the former for larceny and the latter for making false entries on the books of the company with intent to defraud. It is alleged that the defendants were doing a separate business under another firm name and that they connived to pay with Ellis-Ward money for purchases made for the other concern.

S. & M. TIRE CO. FINANCING.

A petition recently filed by the Board of Trade of Coshocton, Ohio, brings to light some interesting details of the alleged operations of those concerned in the promotion of the S. & M. Tire Co., incorporated under the laws of Ohio January 1, 1913, with a capital stock of \$20,000, and to which the Board furnished a factory and plant valued at \$30,000. The incorporators were Alois Michler, Ervin S. Kintz and Charles M. Smith. The petition, asks that a receiver be appointed. In securing the factory site and plant representations were made that the company would commence operations, with a force of at least 100 men, not later than August 1, 1913, manufacturing rubber and metallic tires and accessories for vehicles and other rubber products, but work was never started.

REPORT OF THE CANADIAN CONSOLIDATED RUBBER COMPANY, LIMITED.

OFFICERS AND DIRECTORS OF THE CANADIAN CONSOLIDATED COMPANY.

PRESIDENT D. LORNE MCGIBBON, of the Canadian Consolidated Rubber Co., Limited, submitted on April 6 his annual report covering the year ending December 31 last. "The volume of business done in 1914," the president states, "maintained that of 1913 when the reduction made in selling prices is considered. The whole volume of sales was only 7.98 per cent. less than 1913, while reductions in prices were made of a larger percentage on all rubber goods. This maintenance of volume was obtained, notwithstanding what was probably the most discouraging year that Canada has experienced, due to the great European war and also the disappointing conditions west of the Great Lakes. In spite of the unfavorable financial conditions during the entire year we experienced very little difficulty in making satisfactory collections from retailers both in the East and the West. Losses by bad debts were only slightly increased and ample provision therefor has been made."

He goes on in his report to speak of the fact that the company now owns the whole capital stock of each of its constituent companies, having during the year acquired all the outstanding shares of the Canadian Rubber Co. of Montreal, Limited. He states that the company's tire plant has been in operation throughout the year, with very satisfactory results. He anticipates a successful year for 1915, but says that "under existing conditions no heavy increase in sales should be looked for."

The financial statement of the company is given in full below:

COMBINED STATEMENT CONSOLIDATED AND CONSTITUENT COMPANIES—DECEMBER 31, 1914.

ASSETS.	
Property and plants.....	\$5,452,122.92
Inventories, manufactured goods and materials.....	\$2,939,429.49
Cash.....	57,363.21
Accounts receivable.....	1,119,418.81
Investments, including good will.....	4,404,904.76
Miscellaneous.....	163,856.13
	<u>\$6,755,972.40</u>
	\$14,128,095.32
LIABILITIES.	
Preferred capital stock.....	\$1,980,000.00
Common capital stock.....	2,805,500.00
	<u>4,785,500.00</u>
Six per cent. bonds due October 1, 1946.....	2,600,000.00
Bills payable.....	3,914,634.23
Accounts payable.....	\$374,279.39
Mortgage on real estate.....	1,200.00
	<u>375,479.39</u>
Reserve for bad debts, depreciation, etc.....	105,217.71
Surplus.....	2,347,263.99
	<u>\$14,128,095.32</u>
INCOME.	
Net sales, footwear, tires, mechanical and miscellaneous.....	\$6,245,818.83
Cost of goods sold, selling and general expenses and taxes....	5,282,833.95
	<u>\$962,984.88</u>
Operating profit.....	
*Other income.....	145,860.34
	<u>\$1,108,845.22</u>
Gross income.....	
Bond interest, cash discounts to customers, provision for bad debts and interest on borrowed money.....	629,663.45
	<u>\$479,181.77</u>
Net income.....	
Expenses previous period not provided for.....	38,868.51
	<u>\$440,313.26</u>
Surplus for period.....	
Dividends declared and paid, preferred 7%.....	222,688.50
Dividends declared and paid, common 3%.....	
	<u>\$217,624.76</u>
Net addition to surplus.....	
Surplus, January 1, 1914.....	2,129,639.23
	<u>\$2,347,263.99</u>
Surplus, December 31, 1914.....	

*Includes a profit on the sale of land, \$78,388.67.

At the annual meeting of the shareholders held April 6, D. Lorne McGibbon and Duncan Coulson retired from the directorate. All the other directors were re-elected, and W. H. Robinson, of Granby, Quebec, was added to the board. The board as now constituted is composed of the following members: J. H. McKechnie, T. H. Rieder, Walter Binnmore, R. E. Jamieson, Victor E. Mitchell, E. W. Nesbitt, W. H. Robinson, Col. S. P. Colt, Homer E. Sawyer, E. S. Williams, R. B. Price, W. G. Parsons, A. J. Kimmel.

This leaves two vacancies on the board, no one having been elected to succeed the late Fleetwood H. Ward.

At a meeting of the directors, following the shareholders' meeting, the following officers were appointed: J. H. McKechnie, president; T. H. Rieder, vice-president and general manager; Walter Binnmore, treasurer; W. A. Eden, secretary; R. C. Colt, assistant secretary; A. Dwyer, assistant treasurer.

THE 30TH BATTALION (CANADIAN) WEARS ARCTICS.

The April number of "The Dominion," published monthly by the Canadian Consolidated Rubber Co., Limited, of Montreal, Quebec, contains an interesting illustrated paragraph supplied by J. A. McKenzie, manager of the company's branch at Victoria, British Columbia. The illustration shows a battalion of some 1,200 men which recently left Canada for England, marching through a street in Victoria; and the paragraph states that each man was equipped with a pair of two-buckle "Jacques Cartier" arctics, supplied by this branch.

ANOTHER CANADIAN RUBBER MAN GOES TO THE FRONT.

Lieutenant-Colonel A. S. Massie, manager of the St. John Division of the Canadian Consolidated Rubber Co., Limited, has gone to the front, as the commanding officer of the Divisional Train, Army Service Corps, of the 2nd Canadian Contingent.

AJAX TIRE MILEAGE CONTEST.

The Ajax-Grieb Rubber Co. has announced the results of its annual up-keep contest in pneumatics, which is open to employed chauffeurs only. The winner of the first prize covered 21,985 miles, and 30 of the cash prize winners averaged 16,509 miles per tire, which is nearly equal to the record of the first prize winner of last year's contest, who covered 16,782 miles. This is the second year of this contest, and it will be continued for 1915-16 on the same lines. Blanks to be filled out by chauffeurs desiring to enter the contest have been supplied to all Ajax dealers. There will be 208 prizes, amounting to \$5,000.

THE MORGAN & MARSHALL COMPANY.

At the annual meeting of The Morgan & Marshall Rubber & Tire Co., held at the office of the company in East Liverpool, Ohio, on April 5, the following officers were elected: Patrick McNicol, president; W. A. Hobbs, vice-president; Joseph Betz, secretary and treasurer. These three officers, with R. J. Marshall, D. M. Cronin, Con. Cronin, William Erlanger, W. H. Cochrane, J. H. Cramer, A. F. Ulrich and R. M. Gilleland, were elected to serve as directors for the ensuing year.

This company has effected a new sales organization and will have ready to put on the market by May 1 a new M. & M. red tread tire.

TIRE DISTRIBUTORS ORGANIZE.

At a luncheon early in April plans were made for the formation of an organization, later effected, at Columbus, Ohio, to be known as the Columbus Para Club, membership in which is confined to automobile or motor truck tire distributors. Representatives of the Goodyear Tire & Rubber Co., the Firestone Tire & Rubber Co., and the Kelly-Springfield Co., of Akron; the Racine Rubber Co., of Racine, Wisconsin; the Lee Tire & Rubber Co., of Conshohocken, Pennsylvania, and the United States Rubber Co., of New York, were present at the luncheon and became members of the club.

REPORT OF RUBBER GOODS MANUFACTURING CO.

THE Sixteenth Annual Report of the Rubber Goods Manufacturing Co., dated April 8, 1915, was distributed to the stockholders of that company the last of March. The report of the president, which is brief, and the report of the treasurer, are given in full below:

THE PRESIDENT'S REPORT.

TO THE STOCKHOLDERS OF THE RUBBER GOODS MANUFACTURING CO.

Two considerations materially affected the amount of our sales for the year 1914. The first was the lower level of tire prices, which reduced the amount of sales, although the total number of tires sold was in excess of the previous year. The second was the general business depression due to the European war. This affected our volume of business in mechanical and miscellaneous lines, these lines being very sensitive to general railroad and industrial conditions.

Notwithstanding the reduction in our sales, our total profits were only slightly less than the preceding year, owing to our policy of increasing efficiency and reducing expenses. This has been specially marked in the tire department, as we have made very great decreases in the selling expenses and have adopted a policy of concentration of factory production by which all casings will be made at Hartford and Detroit only, and all motorcycle and bicycle tires are concentrated in Indianapolis.

The report of the treasurer appended hereto gives the consolidated general balance sheet and consolidated statement of the Rubber Goods Manufacturing Co. and its subsidiary companies for the fiscal year ending December 31, 1914.

Respectfully submitted,

ELISHA S. WILLIAMS, PRESIDENT.

THE TREASURER'S REPORT.

RUBBER GOODS MANUFACTURING CO. AND SUBSIDIARY COMPANIES.

CONSOLIDATED GENERAL BALANCE SHEET, DECEMBER 31, 1914.

ASSETS.

Property, Plants and Investments.....		\$33,132,454.41
Inventories, Mfr Goods and Materials.....	\$7,479,802.78	
Cash.....	3,115,153.38	
Bills and Accounts Receivable.....	7,283,172.40	17,878,128.56
Stock Owned in General Rubber Co.....	\$1,666,700.00	
Securities Owned.....	384,030.55	2,050,730.55
Sinking Fund Cash in Hands of Trustee.....		446,708.30
Miscellaneous Assets.....		429,793.60
Total Assets.....		\$53,937,815.42

LIABILITIES.

Capital Stock, Preferred.....	\$10,351,400.00	
Capital Stock, Common.....	16,941,700.00	
Capital Stock, Subsidiary Companies.....	3,537,500.00	\$30,830,600.00
Bonds of Mechanical Rubber Co., and N. Y. Belting and Packing Co.....		852,500.00
Bills and Accounts Payable.....		7,783,533.07
Accounts Payable to General Rubber Co.....		2,813,746.54
Reserve for Federal Income Tax.....		48,597.35
Reserve for A. Agents to Employees.....		106,577.78
Fixed Surplus (Subsidiary Companies).....		2,499,218.65
Surplus.....		9,003,042.03
Total Liabilities.....		\$53,937,815.42

Contingent liabilities for certain guarantees, which are offset by corresponding contingent assets, are not included.

CONSOLIDATED SUMMARY OF INCOME AND PROFIT AND LOSS FOR THE YEAR ENDED DECEMBER 31, 1914.

Earnings.....	\$2,804,625.96
Income from Investments.....	141,669.50
	\$2,946,295.46
LESS:	
Expenses of Home Office.....	\$94,272.97
Interest on Bonded and Floating Debt.....	610,205.16
Federal Income Tax, 1914.....	48,597.35
	753,075.48
NET PROFITS.....	\$2,193,219.98
*Dividends.....	2,143,983.66
	\$49,236.32
Surplus for the Period.....	
Surplus and Working Capital, January 1, 1914.....	\$8,576,509.94
Bond Redemption Reserve Transferred to Surplus.....	377,295.77
	8,953,805.71
Surplus and Working Capital, December 31, 1914.....	\$9,003,042.03

Respectfully submitted,

E. J. HATHORNE, Treasurer.

*Includes \$223,600 paid minority interests in subsidiary companies.

THE DIRECTORS AND OFFICERS OF THE RUBBER GOODS MANUFACTURING COMPANY.

At the annual meeting of the Rubber Goods Manufacturing Co., held April 8, the following directors were elected for the coming year: Walter S. Ballou, Nicholas F. Brady, Charles C. Case, Samuel P. Colt, James B. Ford, Ernest Hopkinson, Charles A. Hunter, Lester Leland, Raymond B. Price, Homer E. Sawyer, Elisha S. Williams. The only new member of the board is Charles C. Case, who was elected in place of Frank W. Eddy, deceased.

The following were elected members of the executive committee: Walter S. Ballou, Nicholas F. Brady, Samuel P. Colt, James B. Ford, Lester Leland, Raymond B. Price, Homer E. Sawyer, Elisha S. Williams.

One new office was added, namely, an additional vice-president, to which position Charles C. Case was elected. The following are the company's officers for the coming year: Elisha S. Williams, president; Charles A. Hunter, vice-president; Lester Leland, vice-president; Charles C. Case, vice-president; Edward J. Hathorne, treasurer; John D. Carberry, assistant treasurer; Samuel Norris, secretary; John D. Carberry, assistant secretary.

TRADE NEWS NOTES.

It has been estimated, from figures given out at the recent Boston automobile show, that the people of New England during the present year will spend \$58,500,000 on passenger vehicles and parts. Of this amount, the estimate for tires is \$17,000,000 and for other accessories \$4,500,000. The combined purchases of tires and accessories in 1914 amounted to \$18,100,000.

Tire manufacturers will be interested to know that the Chicago board of aldermen has under consideration the establishment of a municipal motor omnibus system. The commissioner of public service has made a preliminary report on routes, with estimates on vehicles and installment of the system. The brief period required to put such a system in operation, and thus relieve present congestion, is mentioned in favorable contrast to the time that the construction of subways or other rail lines would take. Such a system adopted by the city of Chicago and working out satisfactorily would probably lead to similar installations in many parts of the country.

The F. S. Carr Co., of Boston, which manufactures waterproof materials for automobile tops, has opened a branch in Detroit, at 971 Woodward avenue.

Hermann Weber, New York representative of J. Schnurmann, of London, engaged in the scrap rubber business, has moved his offices from 150 Nassau street to the Terminal building, 30 Church street.

Some tire purchases of more than usual size have lately been reported, one of these being the purchase by the Ford Motor Co. of 137 carloads of automobile tires, while another was the purchase by a large bicycle manufacturer of 76,647 pairs of Goodrich and Diamond brands of bicycle tires.

The Copithorne Rim & Tire Co., Inc., has made arrangements for the location of a plant at Attleboro, Massachusetts, for the manufacture of quick detachable rims. The company purposes the erection of a plant that will give work at the start to about 500 men.

The Perfection Tire & Rubber Co., of Chicago, has acquired a site at Fort Madison, Iowa, for a manufacturing plant. Work on the new buildings—the cost of constructing and equipping which has been estimated at \$90,000—will be rushed, and it is hoped to commence operations by August 1, with an initial capacity requiring 200 operatives.

At Calgary, in the Canadian Province of Alberta, machines for vending chewing gum are under the ban of the law, being classified as gambling instruments.

The Obituary Record.

ARTHUR L. KELLEY.

ARTHUR LIVINGSTON KELLEY, for many years president of the Mechanical Fabric Co., died at his home in Providence, Rhode Island, on April 7, after an illness lasting several years.

Mr. Kelley was born in Canton, New York, on April 17, 1858, son of Joseph Ham and Samantha Westcott Kelley. He was ninth in descent from Stukeley Westcott, who came to Providence with Roger Williams. He attended the village schools in Canton and Potsdam.

During his spare time he worked in the printing office at Potsdam, where he learned the printer's trade and published an amateur paper for about two years. Later he went to Lawrence, Massachusetts, where he attended the high school and then Phillips Andover Academy, from which he graduated in the class of 1876. After graduation he entered the employ of Stedman & Fuller Card Clothing Co., of Lawrence.

In 1885, owing to increased business, he and Mr. Fuller moved the plant to Providence. The business was later sold to the American Card Clothing Co., and Mr. Fuller and Mr. Kelley founded the Mechanical Fabric Co., with the former as president, the latter as vice-president and manager. Mr. Fuller died in 1899 and since then Mr. Kelley had been president, with his late brother, Edward B. Kelley, as treasurer. Mr. Kelley was president of the Rubber Goods Manufacturing Co. for two years, president of the Narragansett Electric Lighting Co. of Providence, since 1908, director of the Providence Journal Co., United States Rubber Co. and several other manufacturing and insurance companies. He was junior warden of Grace Church and a member of Hope Club, Agawam Hunt Club and Sons of the American Revolution. In 1878 he married Lotta Persis Fuller who, with his two sons, Arthur Livingston Kelley, Jr., and George Fuller Kelley, survives him.

CAPTAIN TRUMBULL WARREN KILLED IN ACTION.

The January number of THE INDIA RUBBER WORLD contained a paragraph stating that Trumbull Warren, president of Gutta Percha & Rubber, Limited, of Toronto, Canada, had gone to the front and had been appointed assistant adjutant of the headquarters staff on Salisbury Plain in England. The sketch was accompanied by a reproduction of a photograph showing Captain Warren in the uniform of the 48th Highlanders of Canada.

On April 21 a cable was received stating that Captain Warren had been killed in action. Few details were given, but it was said that he was killed by a piece of shrapnel while leading a charge on the German trenches and that he was within 50 yards of the enemy's battle line when he was struck. The news caused the most widespread mourning in the city of Toronto,

where, notwithstanding his youth, he had become a very prominent figure.

Trumbull Warren was born in 1886 in London, the son of H. D. and Sarah Van Lennep Warren—both at that time citizens of New York. The following year the family moved to Toronto and shortly after his father established the Gutta Percha & Rubber company. Young Warren graduated at Upper Canada College when about 18 years of age, and, being deeply interested in military affairs, immediately entered the Royal Military College at Kingston, from which he graduated in 1907. He then entered his father's company and made a thorough study of rubber manufacture. Four years ago, on the death of his father, he became treasurer of the company, and two years ago became president, while retaining the position of treasurer. He applied himself to the duties of these offices with great zeal and the company was very successful under his management.

When the war broke out he was one of the first of the Canadians to enlist, and when the troops with which he was connected left England for the field of active operations he was made captain of a company in the Canadian infantry.

Though only 29 years of age, he had established a most enviable place, not only in the business life of Canada but also in its social life. He was an active member of a number of the leading clubs of Toronto. A few years ago he married Miss Marjory Braithwaite, the daughter of a well-known Montreal banker. He left two children, little girls of two and three years of age. He is survived, also, by two younger brothers, Harold D. and Frederic A., and a sister, Mrs. Charles S. Band, of New York City.

C. E. AKERS.

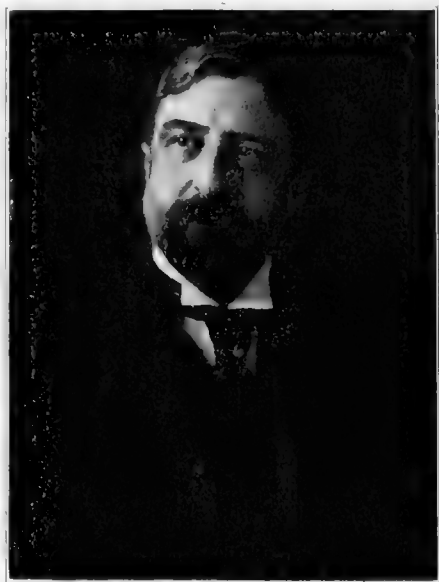
Information has been received of the death, in England, of C. E. Akers, the author of the "Report on the Rubber Industry of the Orient" and of the "Report on the Amazon Valley, Its Rubber Industry and Other Resources."

Mr. Akers was born in the Isle of Jersey in 1861, the son of an English army officer. He was, in turn, a soldier, a newspaper correspondent and special commissioner for the British government. It is in connection with the special commission undertaken by him in 1912 to investigate the rubber possibilities of both the Orient and the Amazon valley that his work is of particular interest to the rubber trade. He was appointed in that year, with two collaborators, by certain large London and Paris interests, to investigate rubber planting in the East, and the possibilities of rubber planting in the Amazon valley. The greater part of the year 1912 was devoted to these two expeditions, and the voluminous reports which he published early the following year attracted a great deal of attention. They were discussed in various issues of this publication, particularly in the issues of April, May, June and July of 1913.

Mr. Akers spent much of the decade between 1893 and 1903 as a correspondent for the "London Times" in North and South America, and while in this country, in 1900, married Miss Charlotte Mabel Dwight, daughter of Colonel James Dwight, of Stockbridge, Massachusetts, who, with two daughters, survives him.

ELIAS L. TOY

Elias Toy, president and general manager of the Buffalo Rubber Manufacturing Co., of Buffalo, New York, died at his home in that city March 27. He was 44 years old, and had been interested in rubber manufacture since boyhood. In 1903 he removed from Akron to Buffalo, where he organized the above named company, establishing a plant for the manufacture of rubber goods. He is survived by his wife and three children.



ARTHUR L. KELLEY.

JACOB MUSLY.

The April number of THE INDIA RUBBER WORLD contained a brief mention of the death—which occurred on March 16—of Jacob Musly, senior member of the firm of Weise & Co., of Rotterdam and Amsterdam. The news was received so late in the month as to preclude any more extended notice at that time.

Mr. Musly was one of the notable figures in the rubber trade of the continent. Though only 46 at the time of his death, he



JACOB MUSLY.

had for many years occupied a conspicuous place among the successful rubber dealers of Europe. At an early age he entered the employ of Knottenbelt & Weise, a large importing house in Rotterdam. It was his ambition from the start to thoroughly familiarize himself with the products of the Dutch colonies, and particularly with all questions of distribution, and he applied himself to this task with great zeal. When a few years later the firm with which he was asso-

ciated dissolved, he went with Mr. Julius Weis, who founded the house of Weise & Co. He was soon taken into partnership, and it was owing not a little to his capacity and energy that the firm soon established a world-wide reputation. It had branches in Java, Sumatra, the Malay States and the Dutch West Indies, and it was the pioneer in Holland in the exploitation of Congo rubber. When the editor of this journal was in Holland in 1908 he visited the office and warehouse of Weise & Co. in Rotterdam and found a great deal there to interest him, which he described in a letter that appeared in the December issue of that year.

Mr. Musly became a recognized expert in rubber and balata, and in fact in gums of every sort. He took a great interest in East Indian plantation development and was a director in the following plantation companies: Bajan Sumatra Rubber Co., Dolok Marangir Plantation Co., Langsar Sumatra Rubber Co., Sangkat Rubber Co., and the Colonial Enterprise Co., of Rotterdam, and also a member of the board of administration of the International Association of Rubber Planters of the Hague.

His death means a great loss to the rubber trade of Holland.

HON. CURTIS GUILD.

New England rubber men and members of the Rubber Club feel a sense of personal loss in the passing of the Honorable Curtis Guild. He was known to all of them, and in the days of the club's beginnings was often a guest and speaker at the Boston banquets.

FRANK S. CHICK.

Frank S. Chick, who at one time was a salesman for the Boston Belting Co., died last month, of pneumonia, after a very brief illness, at the residence of Harry E. Converse, at Marion, where he and Mrs. Chick were visiting. After leaving the belting company he became interested in the John H. Pray & Sons Co. as a salesman, and later rose to the management of the large carpet business of that company. Mr. Chick was in his

sixtieth year at the time of his death. He leaves a widow and one brother, I. W. Chick, of the United States Rubber Co.

ELNO L. FOSTER.

Elno L. Foster, for the past 22 years an employe of The B. F. Goodrich Co., and lately in charge of the cotton hose department of that concern, died Monday, April 12, in the Akron City Hospital. He was 40 years of age, and is survived by his wife and two children.

JAMES QUINLAN.

James Quinlan, of the Eureka Fire Hose Manufacturing Co., died from heart and kidney trouble on April 10.

He was born in New York State 55 years ago, and immediately upon leaving school, at the age of 14, became associated with the Eureka company, as office boy. He gradually worked his way up, until he became the company's special salesman for the states of New York and New Jersey. His connection with this company continued without interruption for 41 years, and in his position as salesman he made a great number of acquaintances and had a host of friends. He was unmarried.

SENATOR N. W. ALDRICH.

The funeral of Senator Nelson W. Aldrich, which was held in Providence, Rhode Island, April 18, was attended by a number of men prominent in the rubber trade. Senator Aldrich's son, Mr. Edward B. Aldrich, is president of the Continental Rubber Co.

THE LATE HOUSTON M. SADLER.

The late Houston M. Sadler had been so long connected with other enterprises that some of the younger men in the rubber trade may be unfamiliar with the fact that he was ever associated with that industry, but at one time, and for a number of years, he held a prominent position in the rubber trade. When the United States Rubber Co. was formed, in 1892, he became attached to the auditor's department. Very soon after the formation of the company he was appointed cashier, and in 1895 was made the company's credit man. On the death of Mr. M. C. Martin—which occurred in April, 1900—Mr. Sadler was made assistant treasurer, Mr. Charles R. Flint being at that time treasurer. On the death of Mr. Charles L. Johnson, the company's general manager, in October, 1901, Mr. Sadler became acting general manager; but a year or so later he left the rubber company and became a member of the New York Stock Exchange. After engaging in the brokerage business for several years he became secretary of the Computing-Tabulating-Recording Co., of New York City, which position he occupied to the time of his death.

RUBBER IN FIRST AID KITS.

The National Affiliated Safety Organization, whose membership embraces various associations, including the National Association of Manufacturers, of 30 Church street, New York, has put on the market a first aid jar, approved and standardized by the Conference Bureau of Safety and Sanitation. This jar is made of glass and is about 9½ inches in diameter and 6 inches high. In it is packed every material which a conference of physicians experienced in treatment of injuries has agreed upon as necessary for effective first aid treatment. The list includes 26 articles, of which two are medicine droppers having rubber bulbs. Another use of rubber in this connection is in the form of a rubber gasket between the jar and its cover. The jar when filled is set in a metal cage, and the glass cover—in which a carrying handle is molded—is held on the jar by spring clips that are a part of the metal cage. The rubber gasket between the jar and the cover renders the outfit sanitary as far as dust is concerned.

Replete with information for rubber manufacturers—Mr. Pearson's "Crude Rubber and Compounding Ingredients."

THE RUBBER CLUB OF AMERICA, INC.

A MEETING of the members of The Rubber Club of America, Inc., was held at the association rooms, 17 Battery Place, New York, April 8, at 3 p. m.

Mr. George B. Hodgman, president of the club, acted as chairman. There was an excellent attendance and much interest was shown in the proceedings of the meeting by the members present. The new constitution and by-laws—the greater part of which were quoted in the March issue of THE INDIA RUBBER WORLD—were adopted.

The following directors were elected to serve until the annual meeting to be held early in January, 1916:

Francis H. Appleton, F. H. Appleton & Son.
 William E. Bruyn, L. Littlejohn & Co.
 Harry T. Dunn, Fisk Rubber Co.
 H. S. Firestone, Firestone Tire & Rubber Co.
 George E. Hall, Boston Woven Hose & Rubber Co.
 George B. Hodgman, Hodgman Rubber Co.
 Frederick H. Jones, Tyer Rubber Co.
 William J. Kelly, Arnold & Zeiss.
 Homer E. Sawyer, United States Rubber Co.
 Henry Spadone, Gutta Percha & Rubber Manufacturing Co.
 Elisha S. Williams, Rubber Goods Manufacturing Co.
 Bertram G. Work, The B. F. Goodrich Co.

Mr. Albert Zeiss stated that he had a matter to bring before the meeting which he believed all would agree was of the first importance. The situation which had been brought about through the British embargo on exportations of plantation rubber from the Federated Malay States and Ceylon had menaced the American rubber industry, and for a time it had looked as though many of the mills would have to close. He believed that The Rubber Club of America, Inc., should pass a formal vote of thanks to Mr. George B. Hodgman, its president, and to those who had co-operated with him on the Embargo Committee in the work of securing a modification of the embargo by the British Government so that supplies of plantation rubber might come forward. He complimented Mr. Hodgman and the members of the Embargo Committee on the efficient and diplomatic manner in which the situation had been dealt with, and moved that a formal vote of thanks be tendered to them. Mr. Samuel Wright seconded this motion, and it was so voted.

MEETING OF RUBBER CLUB DIRECTORS.

The meeting of the directors of The Rubber Club of America, Inc., was held April 21. These were present: Francis H. Appleton, William E. Bruyn, George B. Hodgman, Frederic C. Hood, Frederick H. Jones, William J. Kelly, Henry C. Pearson, Homer E. Sawyer, Henry Spadone and H. S. Vorhis, secretary. The following officers were elected, to serve until the next annual meeting, to be held in January, 1916: President, George B. Hodgman; first vice-president, H. S. Firestone; second vice-president, Van H. Cartmell; secretary and treasurer, H. S. Vorhis.

The committees elected for the current year are given below:

EXECUTIVE.—George B. Hodgman (chairman), Frederic C. Hood, Henry Spadone, William E. Bruyn, H. S. Firestone, Van H. Cartmell.

NOMINATING.—Homer E. Sawyer (chairman), B. G. Work, Charles T. Wilson, Russell Parker, Henry C. Pearson.

LEGISLATIVE.—Frederic C. Hood (chairman), H. Stuart Hotchkiss, Harry T. Dunn.

AUDITING.—Edward E. Huber, William G. Grieb.

BANQUET.—W. E. Barker (chairman), Theodore W. Bassett, S. Theodore Hodgman.

OUTING.—Philip Endicott Young (chairman), R. L. Rice, F. H. Appleton, Jr.

Mr. Henry C. Pearson was delegated to draw up a proper testimonial in appreciation of the services of Mr. J. Frank Dunbar, who has acted as club treasurer for the period from 1909 to 1915.

This testimonial was prepared, presented and adopted and the following minute made on the records of the association:

"TESTIMONIAL.

"The following preamble and resolutions were adopted by the Board of Directors of The Rubber Club of America, Inc., at a meeting held at the Union League Club, New York, on April 21, 1915:

"Whereas, J. Frank Dunbar, for six years treasurer of the Rubber Club of America, has relinquished his position on account of the dissolution of the Massachusetts corporation, we, the Board of Directors of The Rubber Club of America, Inc., have,

"Resolved: That his long and faithful service merits the fullest appreciation of every member of our organization. The duties of his office, often onerous, always exacting, given without compensation of any sort, were performed promptly, cheerfully and adequately.

"Resolved, That we, voicing the unanimous wish of the Association, tender to him our sincere thanks for his years of constant, conscientious service.

"Attest:

HARRY S. VORHIS,
 "Secretary."

NEW MEMBERS.

Six new members were elected to the firm membership of the club. The list of these new companies and the names of those who will represent them in the firm membership of the club are given below:

Aldens' Successors, Limited, New York—F. W. Dunbar, attorney in fact.

Detroit Insulated Wire Co., Detroit, Michigan—Joseph H. Hunter, president.

Marathon Tire & Rubber Co., The, Cuyahoga Falls, Ohio—William F. Ridge, president and general manager.

Midgley Tire & Rubber Co., The, Lancaster, Ohio—Thomas Midgley, general manager and vice-president.

Northern Electric Co., Limited, Montreal, Quebec (Canada)—H. D. Brown, general purchasing agent.

Subers Fabric & Rubber Co., The, Cleveland, Ohio—L. A. Subers, president and general manager.

Jesse E. LaDow, secretary of the Mansfield Tire & Rubber Co., Mansfield, Ohio, was designated as firm representative of that company, instead of G. W. Henne.

Two new associate members were also elected, as follows: William A. DeLong, New York, and Bertram T. Martin, of Everlastik, Inc., Boston.

RUBBER GUARANTEES BEING CAREFULLY OBSERVED.

The conditions imposed on the rubber trade by the British war department have been carefully complied with. The few violations have been of a minor sort that were wholly due to the manufacturer's failure to grasp the meaning of the shipping guarantee. In a few instances goods have been shipped to neutral countries in Europe without going to England, but in all cases it has been found on investigation that the violation was committed through a misunderstanding of the stipulated agreement and not with deliberate attempt to evade the intent of the guarantee.

It is remarkable, considering the large amount of rubber that has been cleared by the British Consul General, that more unintentional violations have not occurred. As a matter of fact there has been only one instance when it was necessary for the consul to refuse to accept guarantees, on account of a violation of the agreement.

Applications for license to export manufactured goods from London to neutral European countries must be made direct to the War Trade Department, No. 4 Central buildings, Westminster, London. In case a manufacturer desires to accept the services of a London agent, the latter should have power of attorney from the manufacturer in order to transact the necessary business.

The war department now demands an affidavit from consignees of manufactured goods shipped to neutral European countries that they will not ship goods to the enemies of Great Britain.

THE RUBBER TRADE IN BOSTON.

By Our Regular Correspondent.

TRADERS in many lines of rubber manufacture. The tire men are not working up to capacity, some reported as running nearer 50 than 70 per cent. This is in part explained by the large and increasing number of concerns which have gone into this business. Mechanicals are being bought only for immediate needs, and these needs are not large. Drug sundries are going well. Clothing men are unusually busy, though the trade in low-priced lines is considerably cut up. The footwear manufacturers have good orders on hand, much larger than a year ago at this time, due to two causes—lighter stocks carried over than last year, and the inducement of an extra 5 per cent. discount for early orders. The rubber shoe factories in this section are making tennis or other cloth upper specialties in footwear, while those making other lines in addition, such as drug sundries, hose, etc., are more than seasonably busy.

The demand for crude rubber is but moderate, but stocks are small, and some difficulty is experienced in securing shipments of stock already bought or ordered on the other side. Consumers who formerly carried a six months' stock continuously, are now buying only in small lots, and few manufacturers are believed to carry more than one-third their former normal supply.

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Benjamin F. Elson, for many years connected with the Boston Belting Co., is still incapacitated for business from the effects of the paralytic shock he experienced last August. His many friends in the trade will regret to learn that he is not yet able to walk far without assistance. Mr. Elson entered the employ of the Boston Belting Co. soon after leaving school, severing his connection with the company to enter business on his own account, but later returning and advancing to the position of assistant manager. He is at his home in Brookline.

* * *

Most people in the United States have heard that Brookline, a suburb of Boston, is the richest town in the country. The wealthy Brookline hates to be disturbed in the early hours of the morning. The worst sleep-disturbers have been the milkmen, whose clattering wheels and rattling bottles prevented the somnolent citizen from enjoying his early morning repose. Thanks to rubber, however, today it is different. The agent for the inspection of milk in that town, going outside the narrow functions of inspecting the lacteal fluid, has inspected the entire outfits of the milkmen, and through his influence the wagons are now equipped with rubber-tired wheels, and the wire bottle carriers have been provided with rubber tube buffers.

* * *

C. J. Bailey, whose many novelties in rubber have long been well known in the trade, and whose rubber heels have made him famous, is now making rubber soles on the Bailey principle that has for so long made the "Wont-Slip" heels so popular, namely, the group of rubber studs which give resiliency and prevent slipping. The soles are made of leather fiber and rubber, and in the tread is an oval space containing five rows of rubber studs and a concentric flat ring. Mr. Bailey makes claims of superiority in the matter of non-slipping, while these soles and heels will not mutilate the grass on tennis courts or golf links; nor will they scratch yacht decks.

In Mr. Bailey's office hang two pictures which are of more than ordinary interest, when their story is known. One of these shows a very crude and rather dilapidated log cabin, the other a modern suburban residence up to date in every detail. The first is the birthplace of Mr. Bailey, and his residence until he reached the age of 21. It was built by his father, a pioneer in a middle western State. The other picture is that of Mr. Bailey's residence in Newton, one of Boston's best suburbs, and

these two pictures tell in a graphic way the story of a successful life.

* * *

M. Norton & Co., dealers in rubber scrap, met with a serious loss on April 27, when their big rubber storehouse in Medford was entirely destroyed, together with a large amount of stock. The structure was a two-story building about 100 x 50 feet, and surrounded on three sides by a high board fence. Marsh grass in the vicinity caught fire, burned through the fence and attacked the storehouse, which was almost instantly ablaze. It was a spectacular fire, dense smoke spreading so far that thousands in surrounding towns were attracted. It was with great difficulty that the metal and machine shop was saved. The loss was well above \$50,000 on building and contents.

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Last month Colonel Frank L. Locke was re-elected president of the Boston Young Men's Christian Union at the sixty-fourth annual meeting of the board of directors. Mr. Locke was formerly well known in the rubber trade, having been for 12 years with the Boston Rubber Shoe Co., resigning the position of superintendent of the factories in June, 1907, to take up this institutional work as president of the Union. During the 8 years he has had charge of the workings of this splendid institution, its scope has been broadened, until today it is living up to its slogan, "Headquarters of Opportunity." The Union is not a charity. Its object is to help young men to help themselves by helping each other. It is a place where young men may meet, compare experiences, secure counsel, form classes to broaden their knowledge and enlarge their efficiency. It is a place where the young men can learn the duties and responsibilities as well as the privileges of citizenship. There is an employment bureau, while its social service is most comprehensive, including many outside beneficences. All this means an immense amount of work and requires a peculiar fitness which Colonel Locke possesses in a marked measure.

THE RUBBER TRADE IN RHODE ISLAND.

By Our Regular Correspondent.

THERE has been a decided and general improvement in the volume of business of the concerns identified with the rubber industry in this state since the first of the year, which has been especially noticeable during the past month or six weeks; and more large orders are reported to have been received during the last week. While not authoritatively acknowledged, it is generally believed that this state is furnishing a considerable amount of goods that are being used by the Allies in Europe, including surgical appliances, rubber boots and solid tires for the war trucks. All of these goods are in great demand and the several Rhode Island factories are working overtime, as a rule. There is reported to be a shortage of competent rubber workers, which is beginning to be seriously felt in the different plants. One large plant, it is stated, would immediately go on a double shift if the proper grade of workers could be secured in necessary numbers.

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The factory of the Consumers' Rubber Co., on Wood street, Bristol, formerly known as the Byfield Rubber Co., and which has been under the management of Terence McCarthy for several years, is enjoying a period of prosperity, with a large force of employes, a full-time schedule and large orders on hand. The concern is to be known hereafter as the Narragansett Rubber Co., Mr. McCarthy having succeeded in securing the plant from the receiver of the Consumers' Rubber Co. Papers relative to the change of name and control were filed with the city clerk at Bristol about the middle of the past month.

A charter for the Narragansett Rubber Co. has been secured from the Secretary of State of Rhode Island, and all the formalities connected with the change have been completed. Mr. Mc-

Carthy will continue in management of the factory, which is producing arctics and tennis shoes, with orders on hand that it will be impossible to fill in several weeks. The orders are from various points of the United States and, according to Mr. McCarthy, there is a prospect of steady employment for the 250 employes for a long time to come.

The construction of the new brick addition to the storage buildings at the plant of the National India Rubber Co. at Bristol was finished about the middle of April and the transfer of goods from the old storage house on Wilson's lane to the new storehouse on the east side of the factory was begun April 15 and occupied about a fortnight.

The shipments from the factory of the National company during the past month have been of such proportions that from 12 to 14 box cars were on the siding at the Bristol station daily. The shipments were principally of tennis shoes. The company's heel-making department has been overhauled and extensive repairing done to the machinery during the past month.

Charles J. Davol, president of the Davol Rubber Co., who has been occupying his country estate, "Wild Acres," in the northern section of Wickford, Rhode Island, has launched his new sea-going power cruiser, "Paragon," in which he will make long cruises during the coming season. The yacht is 120 feet long and has an extreme beam of 14 feet 6 inches, and draws 5 feet of water. She is of the torpedo destroyer type, built entirely of steel, and is expected to make 20 knots an hour. Her gasoline capacity gives her a cruising radius of 1,000 miles, and the motors develop 600-horsepower in two units. The yacht was christened at the launching by Mrs. Davol, who will accompany Mr. Davol on his cruises this summer.

The International Rubber Co., of Barrington, has been made a joint defendant with two other corporations of that town in a suit filed a few days ago in the Superior Court for Providence county by John W. Dodge, of Barrington, in which it is alleged that one or more of the defendant concerns allowed acids, coloring matter, sewage and refuse to run into Allen's Creek in Barrington and damage oysters planted upon leased ground. Mr. Dodge says that he is in doubt as to which of the defendant concerns is liable, and he therefore joins them under the statute in order that the liability may be determined. While the suit is filed for \$50,000 the complainant claims double damages under the statute, making the full amount of his claim \$100,000.

John Anthony, of Attleboro; Frank Healey, and George T. Marsh, of this city, have incorporated at the office of the Secretary of State of Rhode Island under the name of the Anthony Rubber Manufacturing Co., with a capitalization of \$100,000. The corporation, under the terms of its charter, is authorized to buy, sell and otherwise deal in crude rubber and rubber goods, and to manufacture rubber tires.

Several of the army corps now at the front in France and Belgium are wearing rubber boots which were made in Rhode Island. It has been known for some time that the mills of the United States Rubber Co., situated at Woonsocket, were very busy, but only recently has it come to light that these rubber boots were for the soldiers. Included in the order received by the Woonsocket mills, according to reports, was an admonition to keep the order secret and to have the goods shipped out quietly. The boots, which were ordered through an agent of the Allies, have been in the possession of the men in the trenches for some time. The Alice mill at Woonsocket and the Millville mill at Millville both have an unusually large number of orders on hand, and the rush is expected to continue indefinitely.

THE RUBBER TRADE IN TRENTON.

By Our Regular Correspondent.

IF the demand for rubber manufacturing machinery can be taken as an indication, there is every reason to look for a most prosperous year in the trade.

The John E. Thropp's Sons Co., which has a large plant devoted now almost exclusively to the making of rubber machinery, is working nights to keep up with orders and has plans drawn for an addition, which will give it several times its present capacity. One new building 300 x 60 feet is now being rushed to completion. When this is finished the present shop will be torn down and rebuilt on a more extensive scale. The new business necessitating the increased capacity is of normal character and not the result of any passing stimulus. This concern's reputation in machinery manufacture is steadily broadening. A large order for a tire-making factory in France, placed before the outbreak of the war and held up for some time on account of it, is now being turned out. Another order now under way at the shop is for the Mecca Tire Co., which will shortly start the manufacture of tires in this city. This last-named order will be completed in about six weeks.

The Royal Rubber Co., which makes a line of druggists' sundries, is passing through a troubled period. Samuel Treeger and Herman Minzesheimer are the principals in the concern. Minzesheimer has brought suit against Treeger, while Treeger has applied for a receiver for the company. Justice Newburger has appointed Jacob Klein to act as receiver. Edward Aswitz, factory manager for the Royal Rubber Co., says that the plant had orders sufficient to keep it operating to capacity for several months to come. He said the concern had plans drawn for the erection of a new plant next year.

The Essex Rubber Co. is establishing a chain of "Blue List Cobbler Shops" which it plans to extend eventually to every state in the union for the handling of its line of "Shedwet" soles. A representative cobbler is to be selected in each locality to handle the line, and a conspicuous window poster will officially designate each shop. The Essex Mutual Benefit Association has been formed under the supervision of the heads of the company to take care of employes of the concern in times of sickness or disability from accidents.

The opening of the baseball season has brought about the formation of clubs at the Essex, Thermoid and Empire plants. A rubber club league with nines from the different factories in the trade may be the result.

William R. Thropp & Sons, makers of rubber machinery, have taken on the manufacture of a collapsible tire core patented by Fred R. Parker, of this city. Several tire manufacturing companies have already adopted the core, which is said to cost less to make than the old style, and to be lighter. The principal feature of the new core is the doing away with all rings and bolts. To open the core it is only necessary to drive out four steel taper pins, releasing the steel strips which allow the core to separate into four sections.

Fire of unknown origin wiped out the plant of the American Rubber Manufacturing Co. here today. The flames spread to adjoining structures and did a total damage of \$42,000.

The heaviest loser is the American Rubber Manufacturing Co., which recently installed much valuable machinery. A watchman employed by the company discovered the flames before they had made much headway and he ran quickly to the office to give the alarm. The 'phone is said to have been out of order and this caused a delay.

Antonio di Piano, head of the rubber concern, said business would be resumed as soon as possible in a new building. The company was rushed with orders and the fire could not have come at a worse time. The concern makes rubber soles, mats and kindred articles.

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The Delion Tire & Rubber Co., though just starting business, has found its machinery inadequate to care for incoming orders. A new tire machine and a new vulcanizer are to be installed at once, doubling the present equipment. O. S. Hatton, who was with the Thermoid people for 5 years, has become office manager for the Delion company.

Arthur Colvin, formerly with the Globe company, has taken a position as factory superintendent with the Delion company. He succeeds A. A. Peterson, who has taken a position at Akron, Ohio.

The prize of \$25, offered for the best slogan submitted for advertising the Delion tire, has been awarded to a Trenton girl, who suggested "Delion tires for particular buyers."

Samuel J. McDonald and M. William Murphy, under the firm name of McDonald & Murphy, have opened a wareroom at 112 North Warren street for the sale of Delion tires and tubes. Mr. McDonald was for 9 years a road salesman for the Acme Rubber Co.

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William J. Swick has opened a wareroom at 203 East State street, where he will handle Acme, Century, Congress and Pullman tires.

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The Zee Zee Tire & Rubber Co. has bought a factory building at Yardville, just below Trenton, to make rubber specialties for the automobile trade.

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Elbert Hubbard, the sage of East Aurora, made an inspection of the plants of the Empire Rubber & Tire Co. and the John A. Roebing's Sons Co. this week. He was in Trenton as the guest of the Chamber of Commerce. He promised to write his impressions in the near future in an article entitled "A Little Visit to Trenton." C. H. Oakley, of the Essex Rubber Co., was one of the Chamber of Commerce committee named to pilot Fra Elbertus about the city.

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The Globe Rubber Tire Manufacturing Co., has increased its force within the past five weeks from 160 to 350 men. The concern is now running 22 hours a day. Owing to pressure of business it has become necessary to provide more room at the plant. Work will be commenced shortly on a new building which will accommodate the offices, machine shop and shipping room.

THE RUBBER TRADE IN AKRON.

By Our Regular Correspondent.

STOCKS of rubber on hand in the rubber storehouses of this city are said to be worth at the present time close to \$10,000,000. Unusual buying has been going on as a result of war uncertainties, and never before has so much raw material been on hand at one time.

Some of the larger Akron factories are small cities within themselves, with populations of from 5,000 to 12,000, provided with all the appurtenances of the modern city—libraries, hospitals, police and fire departments, restaurants, dance halls, etc. All the plants are busy, running full time. The output is larger than ever before and the companies are advertising in outside papers for additional help. Good strong men of reliable character are in demand.

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Charles DeWoody, former Akron man, now one of the western representatives of the federal department of justice, has reported to his department, after an investigation of the Akron

rubber industry, that there is not the slightest foundation for the report that a "trust" exists here. His reports show, on the contrary, that the competition is unusually spirited.

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As the result of a bill which has passed the Ohio General Assembly, The B. F. Goodrich Co. has been enabled to purchase land along the Ohio canal adjoining its factory buildings. A new addition to the plant, costing approximately \$500,000 is to be erected this year—not, it is stated, on this property.

According to a decision handed down recently by Federal Judge John H. Clark, of Cleveland, the patent for reclaiming crude rubber by what is known as the alkali process, held by A. H. Marks, of the Goodrich company, is invalid. The decision was given in a suit brought against the Portage Rubber Co., of Barberton, Ohio, by the Philadelphia Rubber Works Co., which operates a reclaiming plant here. The claim was made that the Portage company infringed on the Marks patent. Marks was granted the patent October 17, 1899. The case will be carried to a higher court.

A. H. Marks, vice-president of the Goodrich company, has denied reports current in Boston and New York that dividends on common stock of the company are to be resumed.

This company has ready for distribution three booklets on California for automobile tourists who expect to visit that country during the coming summer. These show with detailed maps and road logs all the best highways as well as the most interesting scenery along the route.

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An injunction to restrain the Swinehart Tire & Rubber Co., of Akron, from selling a type of non-skid tire on which the complaining company claims a patent, has been filed in the federal court at Cleveland by the Keaton Tire & Rubber Co., of San Francisco. Damages are also asked. The petition claims that the tire was invented in 1910 by Robert Keaton and that the Swinehart company has sold tires infringing on Keaton's patent for a profit of at least \$50,000.

Work on a \$50,000 three-story factory and office building has been started by the Swinehart company.

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The Firestone Tire & Rubber Co. has added a new wing 200 feet long and four stories high to its office building.

Service men of the Firestone company closed a three-day convention in Akron Saturday, April 17.

"The best safety device known is a careful man," is a sign that greets workers everywhere in the Firestone factory. Robert E. Lee is director of safety and welfare for the company.

Members of the Firestone Tennis Club, recently organized, are M. E. Ake, assistant superintendent; L. G. Fairbanks, assistant advertising manager; E. M. Slater, of the engineering department; F. B. Dodge, of the branch efficiency department; A. G. Roberts, of the purchasing department; H. G. Polhamus, of the credit department, and W. G. Manley, of the branch efficiency department. Courts are being built at Portage Path and Crosby street.

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One of the finest herds of cattle owned in this part of the country is that on the estate of A. H. Marks, of The B. F. Goodrich Co. Mr. Marks spends much of his spare time on his Elmcourt farm.

Messrs. W. H. Allen, of the Goodrich; Y. E. Hale and E. R. Hall, of the Goodyear; C. C. Carlton, of the Firestone, and J. H. Wagenhorst, of the United Rim companies, have been made members of the S. A. E. Standards Committee.

T. W. Blackwell, who has been associated with the Goodrich Indianapolis branch for more than 12 years, has resigned to organize a company at Wichita, Kansas, for the manufacture of tires.

I. R. Bailey, a former Diamond employee, is now manager of a

mechanical rubber goods department for the Goodyear Tire & Rubber Co.

Cliff Mathewson, associated with the Pacific Coast work of the Diamond Rubber Co. before its consolidation with the Goodrich, is now associated with the sales force of The Norwalk Tire & Rubber Co., promoted by W. B. Miller, former Diamond official.

War orders for American auto trucks has had the effect of an impetus to the manufacture of solid auto tires by Akron companies.

THE RUBBER TRADE IN CHICAGO.

By Our Regular Correspondent

GENERAL conditions in the rubber trade here are much more favorable than they were a few months ago, according to the leading members of the industry. In the mechanical rubber line the demand for belting and packing has picked up considerably, due to the spring repairs which are being carried out in the various mills and factories of the West and also to a recent boom in western mining operations.

Practically all of the local tire firms report an excellent business, due to the early spring, bringing out hundreds of cars which ordinarily do not appear until several weeks later. The highways in the vicinity of Chicago, which are usually almost impassable at this time of the year, are already in good condition, motorists are enjoying country trips and, incidentally, consuming tires.

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H. Muehlstein & Co., dealers in scrap rubber, with offices in New York, Akron and Chicago, have removed their headquarters in the last-named city from 407 South Dearborn street to 114 West Van Buren street.

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The Mills Novelty Co., which manufactures coin-operated automatic instruments, announced last week that it would enter the player piano field and would add a department at once for the manufacture of these instruments. The entire piano, including the action, will probably be built at the factory. The company will therefore be in the market for large quantities of rubber tubing in addition to the amount heretofore used in the manufacture of automatic instruments.

Rubber men of the city expect to be called in the examination which is being made by a sub-committee of the Illinois State Legislature with a view to gathering evidence to be presented in connection with the woman's eight-hour bill, which comes up for passage in the near future. The plan of the committee is to get the views of every employer of female labor in the city. The employers who have testified thus far have taken the stand that the present is a poor time to enact laws which means extra expense on the part of the manufacturer. The Illinois Manufacturers' Association has gone on record as opposed to the bill, and recently sent a large delegation to Springfield for the purpose of opposing the measure. Attacks on business at this time, it was pointed out to the legislators, might result disastrously for employers and employes as well, for any additional expense might make necessary the closing of many plants.

Marcus S. Hill, general foreign ambassador of the Illinois Manufacturers' Association, was consulting with local rubber men last week with a view to getting some prominent rubber manufacturing company of this city to join in the plan on foot to open general warerooms for the display of American goods in the leading foreign cities. Mr. Hill will leave shortly for London, where one of the branches is to be established. Petrograd, Melbourne, Sydney and Buenos Aires are other centers mentioned.

THE RUBBER TRADE ON THE PACIFIC COAST.

By Our Regular Correspondent.

THE rubber trade, or at least the demand for tires, which is the chief item in the rubber trade of this section, will probably experience considerable improvement over present very favorable conditions as a result of the work now being done on State highways. This work is costing the State about \$18,000,000, and with its completion the farmers throughout the section will undoubtedly take advantage of the more direct and convenient means afforded by the automobile truck for the transportation of their product to buying centers; which means interesting possibilities to distributors of truck tires.

Transcontinental travel is also expected to be unusually heavy this year, doubtless entailing the renewal of a great many tires and other equipment. The American Automobile Association, up to April 1, had distributed touring information, on request, to 1,000 persons interested in making a trip to the Pacific coast—a number far in excess of past similar requests.

* * *

Western investors in the La Zacualpa Rubber Plantation Co., the La Zacualpa Plantation Co. and the Hidalgo Plantation & Commercial Co. have lately received notice of the formation of a new company, under the laws of Nevada, and known as La Zacualpa-Hidalgo Rubber Co., which is designed eventually to take over the rubber acreage of these three plantations in Mexico. For present acreage certificates, holders are to receive shares of stock in the new corporation. The notice also contains an announcement of the transfer of administration of the plantation in Mexico from O. Harrison, who promoted the original companies, to Graham M. Kerr, representative of the reorganized concern, and also the statement that title to the properties will be transferred to the new corporation as soon as political conditions in Mexico are such that it can be legally done. The officers of the new company are: E. R. Stackable, president; E. J. Boyes, vice-president; John A. Bishop, secretary and treasurer; and the board of directors includes these three, together with Robert Davies, F. E. Litchfield and L. A. Ward.

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A new tire is being manufactured in San Francisco, for sale under a 10,000-mile guarantee against defects in material and workmanship. This is made by the Wearproof Tire Products Co., which agrees to repair free of charge any tire that fails to give this amount of service.

H. E. Hollenbeck, representative of the Michelin Tire Co. on this coast, has made arrangements with the Turner-Snyder Rubber Co., of Tacoma, Washington, to handle in that section the products of the Michelin factory at Milltown, New Jersey.

* * *

The motorcycle race of April 4 at the Venice track, California, was both interesting and important in racing circles, the record made, of 69 miles an hour for a distance of 301 miles, being 8 miles an hour faster than the automobile record over the same track. The winning motorcycle, as also those taking third, fourth and fifth places, was equipped with Firestone tires.

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The Pacific coast branch and district managers of the Goodyear Tire & Rubber Co. recently attended a conference in Seattle, presided over by M. E. Morris, chief of the San Francisco branch. Others who took part in the conference were: C. B. Reynolds, of Tacoma; H. Jurgewitz, of Spokane; C. H. Williams, of Portland; C. C. Miller, of Seattle, and W. J. McAllister, who has charge of the truck tire business of the company on the coast.

* * *

The Macdonald Sales Co. has opened a store and service station at 506-8 Pine street, Los Angeles, for the sale of W. J. Macdonald treads.

... ..

the first of these was taking a spring as surmounting the ridge, and then the winter party. In these expeditions were made a full circle. The spring in this case was a full circle, and all had been used to make a complete circle. The spring was used with a spring machine, and given in the form that any of the full circle was used. After altering the spring calendar and the spring calendar, the spring calendar was used. The spring calendar was used after the spring calendar—passed and passed. The spring calendar was used after the spring calendar. The spring calendar was used after the spring calendar.

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1. The first step in the process is to identify the problem or issue that needs to be addressed. This involves gathering information and understanding the context of the problem.

2. Once the problem is identified, the next step is to define the objectives and goals of the project. This helps to clarify what needs to be achieved and provides a clear direction for the work.

3. The third step is to develop a plan or strategy to address the problem. This involves identifying the resources needed, the tasks to be completed, and the timeline for the project.

4. The fourth step is to implement the plan. This involves putting the strategy into action and monitoring progress to ensure that the project is on track.

5. The final step is to evaluate the results of the project. This involves assessing the outcomes against the objectives and goals, and identifying any lessons learned for future projects.

We hear it now and then of ways of pumping air in with pressure to make blisters behave themselves. When the time comes that blisters are kept under by this process it can be adapted to the tire trade, instead of making shoes as per tires.

Then the way of exhausting the air. It might come out this way. A factory was annoyed and had the black mill increased in a small room; this room was air tight. From the top of the room a tube of building a line about 2 feet in diameter, at the end an exhaust fan. This would have been a grand success, only it sucked about all the compound out and the operator had a narrow escape.

"I am of the whole matter, it is absurd to think, in this enlightened age, with all the different organizations for the benefit of mankind—and a few women—that the average of job discrimination can be over 10 per cent."

The cut mobile bath was not a something new both in automobile construction and in military use, but such a car has recently been built for the order of the St. John Ambulance Association of England and sent to the front. This automobile is supplied with 12 folding bath tubs, made of waterproof canvas mounted on folding iron frames. When in use the tubs stand on the ground on each side of the car in tents formed by drawing out a canvas partition that has been rolled up close against the side of the car and which is supported by tent poles. Thus two arrangements are formed, each about 8 x 10 feet in size, with the car in the center. A canvas floor covering is provided for each tent and to keep the water at the rate of 2 gallons a minute, are supplied from tanks the high rubber hose pipes, while reasonable quantities of sterilized drinking water are also provided.

As a result, the movement was made directly to the area where the Spanish soldiers, caused by the seizure of the quantity of clothing of the Spanish tank in Toledo when it was being transported in Mexican trucks to the area of Mexican port in that

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The India Rubber Trade in Great Britain.

By Our Regular Correspondent.

THE new bill passed by Parliament in March giving the government power to take over and control works manufacturing munitions of war is an innovation of considerable importance to those concerned. The main objects are to expedite production and to deal drastically with strikes among workmen. One of the means taken to obviate strikes is to limit the profits of firms on war-office work to 10 per cent. above their ordinary profits, the men having got the idea that, though they themselves are earning increased wages, the masters are rapidly piling up fortunes; which is by no means universally the case. So far I do not hear of any rubber works being affected by the bill, though manufacturers acknowledge that its provisions apply equally to such goods as motor tires as to guns, explosives and motor wagons. At the time of writing the superman, to use a current term—who is to act as general manager under the bill has not yet been appointed. What is known in America as a "hustler" is being looked for, and it seems that 2,000 or 3,000 have sent in applications for the position.

The general agitation for a rise in wages to meet the 25 per cent. increase in the cost of provisions has extended to the rubber trade, and what is known as a war bonus has been granted in most of the rubber factories in the Glasgow and Manchester districts. Negotiations with the manufacturers have been carried on by Mr. H. H. Duke, the organizer of the Amalgamated Society of India Rubber Workers, whose office is in Manchester, and it is pleasant to be able to record with what amicability these have been conducted compared with certain proceedings in the past. Not that such negotiations have been necessary in all cases, because I know of instances where the war bonus was granted immediately the rise in the cost of living took place, or at any rate was generally recognized.

From all accounts the rubber and tin export committee is carrying on its functions as far as rubber is concerned to the satisfaction of those concerned with the embargo. With regard to trade, now that the government seems to have placed all its important orders, there is a tendency to expect slack times when these are worked off. The rush for solvent naphtha led to a rise of about 3d. per gallon, to 1s. 5d., a price which cannot be considered excessive. There is no reason, however, to expect any shortage in the article, although a larger amount of pure xylol is now being produced in connection with the color industry.

The main difficulty with regard to business other than government business at the moment is in connection with the railway companies, great delays being experienced by manufacturers both in getting their supplies and in forwarding finished goods. Very little detail has been allowed to leak out regarding the movement of troops, but this has been on a large scale, with the result that general goods traffic has been greatly disorganized.

With regard to rubber chemicals, the one which seems to be most affected at the present time is golden sulphide of antimony. One cause of this is the shutting off of the German and French supplies, and another is the great rise in the price of the metal, to nearly £90 per ton, Russian demand having a good deal to do with this. Though there are a number of sellers of golden sulphide in England, I believe I am right in saying that there are only two actual manufacturers, and the state of affairs in America seems to be much the same. The British makers have been inundated with orders, which they have been quite unable to fill at the moment. They are enlarging their

plants, and, all things considered, it cannot be contended that the rise of 4d. per pound is at all excessive. Golden sulphide is on the list of absolute contraband, as it is one of the materials used in fuses.

PLANTATION RUBBER.

An interesting and important statement was made at the London Rubber Exhibition conference by Mr. W. A. Williams, of the North British Rubber Co., Limited, to the effect that he had not found smoked plantation rubber to be superior in any way to unsmoked. As much undoubtedly depends upon the particular brands of rubber he experimented with, it is quite possible that other manufacturers may have come to the opposite conclusion, though it is pretty generally conceded that the various methods adopted for smoking plantation rubber after coagulation are only a poor imitation of the well known method carried out on the Amazon with fine rubber. It would certainly be of general interest to know how far Mr. Williams' statement receives general support.

While on the topic of the quality of rubber, perhaps I may mention one of the results I have obtained from some atmospheric tests of raw rubber. Various samples of raw rubber were hung up on the garden wall for 17 months, experiencing frost, sun, rain, etc. One result I have obtained has, I must confess, somewhat surprised me. The resin content of the hard fine Para sample increased from 2.5 per cent. to 15.5 per cent., while one sample of smoked plantation rubber showed only 5 per cent. resin against 4 per cent. originally, and another sample from a different source gave a very similar result. The origin of the plantation samples is unknown to me. I am not putting these results forward as a contribution to our scientific literature, as the experiment was not carried out with any special precautions, but as there is no reason to doubt their substantial accuracy, I think it is only fair that they should see the light. A manufacturer with whom I discussed the matter said that he would have expected the fine hard to give the better results, and expressed the opinion that this would be so if a compounded and vulcanized sheet of each had been exposed to the same conditions.

RUBBER AND HYGIENE.

In a recent bulletin from the United States Hygienic Laboratory (No. 96, 1914), special reference is made to the composition of the rubber in nursing nipples and teething rings, one of the conclusions arrived at being that rubber containing antimony is undesirable in articles for infants. What surprises me most about the analyses is the presence of clay, zinc oxide, magnesia and various compounds, and it would be interesting to know whether these goods are produced in America, or whether they are of Teutonic origin. In England it has always been customary to use pure vulcanized rubber for these goods, the main change which has taken place in the manufacture in the last 40 years being the substitution of the seamless teat made from rubber solution for the teat which was made from cut sheet and jointed by pressure on a mandrel. The use of silicates or metallic oxides was never thought of, nor was the black color due to any added material, being the natural result of the sulphur bath. Perhaps one ought to mention the production a few years ago of transparent teats by the Leyland & Birmingham Rubber Co., Limited, these being made from a special brand of Ceylon plantation rubber. These teats, as also many of the ordinary seamless variety, were vulcanized by the cold cure process.

OBITUARY.

In the person of Mr. W. A. Oddy, of Rochdale, there has recently died a man well known to the rubber trade in the Manchester district. Mr. Oddy, who was 71 years of age, though at one time connected with the textile industry, about 30 years ago went into the waste rubber business, in which he rapidly gained wealth. This was in the good old days when waste rubber, like cinders, was to be had more or less for the cost of carting, and when the close competition of today was not existent. His firm is now known as Oddy & Whitworth. He was in close connection with the late Mr. Thomas Rowley, and had been for some time head of the firm of Grimshaw & Co., rubber chemical manufacturers, with which Mr. Rowley was connected. He was also a director of G. W. Laughton & Co., Limited, rubber manufacturers, Clayton, Manchester.

TOO MUCH ANALYSIS.

The letters which have recently appeared in THE INDIA RUBBER WORLD under this heading meet with general approval among our manufacturers, who, as a rule, hold the opinion that they understand how to fill the customers' requirements to the best advantage without the auxiliary aid of precise specifications. Further, they have a profound suspicion of the correctness of the figures obtained by the purchaser's chemist. This suspicion will be enhanced rather than allayed by what has recently appeared in THE INDIA RUBBER WORLD regarding discrepancies in analyses. These results, it is understood, were all the work of chemists specially versed in rubber analysis. In Great Britain, however, the rubber manufacturer knows that his products are in many cases tested by men who have only a cursory acquaintance with rubber analysis, and this has naturally led to a good deal of dissatisfaction.

I could give numerous instances, but will only mention one, where goods were rejected because they contained plaster of Paris, which the manufacturer knew he had not used. The explanation of the discrepancy was that the chemist had taken the mineral matter by direct ignition. This resulted in the formation of some sulphate of lime or plaster of Paris by the combination of the lime of the whiting with the free sulphur. Outside government contracts there is comparatively little rubber manufacturing in Great Britain to strict specification, certainly not as much as appears to be the case in America and Germany. A year or two ago reclaimers took to selling their products on analysis, a course which apparently was forced upon them. Of late, however, the practice has been dropped. Analysis strikes at the root of what the rubber manufacturer holds most dear—secrecy—and as long as he does not advertise his own figures he can always assert that those obtained by the purchaser are wrong if they are not flattering enough.

SPALDING VS. GAMAGE.

The case of Spalding vs. Gamage, which was mentioned in THE INDIA RUBBER WORLD for September, 1913, has been definitely disposed of before the House of Lords in London.

This interesting case may be briefly stated as follows: The London branch of the well-known American sporting goods firm, Spalding Brothers, discarded some 500 rubber footballs of a model known as the "Orb," selling them to a waste rubber dealer at something like 4d each. The waste rubber dealer in turn sold these balls to the large London sporting goods firm of F. W. Gamage, Limited, at about 1s. 2d. a piece. In the meanwhile Spalding Brothers brought out a new football, which they advertised as the "New Improved Sewn Orb"—price 10s. 6d. At the same time the Gamage's advertised the old "Orbs" which they had purchased from the waste rubber dealer, for sale at 2s. 10d., stating that the usual price of this ball was 10s. 6d., and giving a description of it which was substantially the same as that which Spalding Brothers gave to their "New Improved Sewn Orb." This occurred in 1910. An injunction was

granted and the question of damages was being determined when the Court of Appeals reversed the judgment.

The decision of the House of Lords, which is the supreme court of appeal of the British Empire, restores the first order by allowing the appeal with costs. In passing judgment Lord Parker said that the advertisements of A. W. Gamage, Limited, were calculated to deceive.

BRITISH TIRE STANDARDS.

The Tire Committee of the British Society of Motor Manufacturers & Traders proposes to reduce its pneumatic tire rim standards to a total of 10, and its tire standards to the 11 different sizes here given. The proposed tire sizes are:

Millimeters.	Equivalent in inches.
700 x 80	27.5 x 3.14
700 x 85	27.5 x 3.34
710 x 90	27.9 x 3.54
760 x 90	29.9 x 3.54
810 x 90	31.9 x 3.54
815 x 105	32.1 x 4.13
820 x 120	32.3 x 4.72
880 x 120	34.6 x 4.72
8 5 x 135	35.2 x 5.31
835 x 135	32.8 x 5.31
915 x 175	36.0 x 6.88

These are practically the standards long recognized all over continental Europe and at present effective throughout the Old World. The assumption is that these figures represent the exact measurements of the tires and not, as is at present the case in Europe, fictitious measurements which vary from one make of tires to another. It is noticeable that no provision is made in these standards for those large tires so extensively used on heavy machines in Great Britain and Belgium. This announcement is of great importance to American manufacturers of both tires and automobiles, for no American made cars are turned out to conform with these standards.

RUBBER SHIPMENTS RATHER SLOW.

Much irritation is felt in the British rubber trade on account of the delay in the issue of export licenses. Tons of rubber goods are held up at ports of shipment owing, it is said, to congestion in handling applications for export licenses. Chambers of Commerce have taken the matter up with the government, whose explanation is that the export licensing department is a new organization and must be allowed time to get into smooth working order.

Birmingham is endeavoring to create some sort of an organization to bring to that city the great business formerly handled at the Leipzig Fair.

AN ENGLISH VIEW OF A DUTCH SITUATION.

A recent number of our English contemporary, the "India Rubber Journal," contains the following interesting paragraph:

"Since the Dutch Government has forbidden the export of tires, short motor trips into Germany have become quite popular. Many cars which cross the frontier with a set of new tires return with them utterly worn out, after a small mileage only; yet this does not deter the ardent motorist, for the trip is so enticing that another journey is undertaken almost immediately, with a fresh set of new tires. Where there's a wheel there's a way."

Burberrys, Limited, of Haymarket, London, who beside manufacturing weatherproof clothing for all occasions, including aviators' outfits and service equipment, also make tents of proofed material, have presented to the British Red Cross a motor soup-kitchen, built to approved specifications and completely fitted.

Should be on every rubber man's desk—Crude Rubber and Compounding Ingredients; Rubber Country of the Amazon; Rubber Trade Directory of the World.

BRITISH NEWS NOTES.

English rubber manufacturers are being put to considerable expense through the railways' refusal to accept empty cases. Both labor and wood are high and much money is being spent unnecessarily on packing. Many houses have resorted to forwarding their goods in strong parcels.

Tire manufacturers are busy with the opening of the new season. The great demand is for tires for light cars.

The mechanical trade is fairly good and the rubber heel trade has also improved since the war began. There is an unprecedented demand for bed sheetings, both with single and double face.

The British Insulated & Helsby Cables, Limited, of Helsby, Cheshire, has declared a final dividend, which brings the total for the year up to 15 per cent. Dividends for 1913 amounted to 13 per cent.

The International Tyre & Rubber Co., Limited, has recently been registered in London, with a capital of £5,000, and with offices at 1 Marsham street, Westminster, S. W. E. M. Reid and J. A. Howard are named as first directors.

The Belgian Colonial Office has been transferred, temporarily—until peaceful conditions are again established in Belgium—to India House, Kingsway, W. C., London, and publication of the "Bulletin Agricole du Congo Belge," which had been suspended, will very soon be resumed.

The Rubber and Tin Exports Committee, London, to which all applications must be made for licenses to export these products, on April 6 removed its offices from the Westminster Palace Hotel to 3 Queen Anne's Gate, Westminster, S. W.

Sir John French, of the British Army, explained the retreat of the French troops before Ypres, on April 22, by saying that



Courtesy of N. Y. Times.

ENGLISH SOLDIERS GUARDING AGAINST ASPHYXIATING SHELLS.

they were overcome by fumes, "the Germans making use of appliances for the production of asphyxiating gas." The photograph reproduced above shows the soldiers digging in the trenches protecting themselves from the effects of these gas-producing shells. A respirator is often worn, which is made of soft rubber that fits closely over the nose and mouth and is equipped with a filtering sponge. Most of the soldiers shown in the picture appear to have improvised a respirator by tying handkerchiefs over their faces, filled undoubtedly with a wet pad of cotton wool or some other porous material.

About 150 aeroplanes, valued at from \$3,000 to \$4,000 each, were received at Tacoma, Washington, early in April, for shipment to Vladivostok, Russia, by Japanese steamship, for use by the Russian army.

FRANCE'S COMMERCE IN RUBBER GOODS.

The following tables, according to a report under date March 11, by Consul General A. M. Thackara, stationed at Paris, show the commerce of France in crude rubber and manufactured rubber goods for 1913 and 1914:

	1913.		1914.	
	Quantity, Metric tons.	Value.	Quantity, Metric tons.	Value.
Imports of crude rubber	17,441	\$23,607,000	11,567	\$15,717,000
Exports of crude rubber	16,687	14,579,000	6,489	8,817,000
Imports of manufactured rubber goods	3,326	8,566,000	2,043	5,287,000
Exports of manufactured rubber goods	6,930	12,356,000	6,068	17,151,000

The table below shows the distribution of this foreign commerce for the year 1914:

	Imports from	Belgium.	Germany.	Great Britain.	Russia.	United States.
Crude rubber		\$207,000	\$455,000	\$6,943,000	.....	\$806,000
Manufactured rubber goods		625,000	1,861,000	2,199,000	\$65,000	143,000
Exports to						
Manufactured rubber goods		1,285,000	875,000	5,333,000	58,000	.....

There were also shipped from the Paris consular district to the United States, the Philippines and Porto Rico, during 1914, rubber goods and waste to the value of \$295,794, against similar exports in 1913 amounting to \$482,376; from the Reims district, rubber substitutes valued in 1914 at \$17,183 and in 1913 at \$23,059.

In the scale at which motor vehicles are impressed into the military service in France, tires in good condition are rated at £10 each.

EMBARGOES.

On March 12 Sweden added to the list of articles prohibited export from that country, copper wire rubber insulated and other—also articles of rubber for medical or hygienic use, and gutta percha paper and plasters.

A decree of March 30 prohibits the export from Spain to foreign countries of crude rubber, both natural and artificial, and of similar materials.

Denmark has also prohibited the export from that country of inner tubes and covers and other goods made principally of rubber, together with reclaimed rubber and rubber waste.

The Turkish Government has recently placed cables, cable materials, benzine and rubber on the conditional contraband list.

RUBBER SMUGGLING.

A report from Naples, Italy, by way of Paris, tells of the discovery by the police of an attempt to smuggle through Italy a large quantity of contraband goods apparently intended for Germany. Among these are said to have been 300 hogsheads labeled resin but which actually contained gutta percha; these being from the United States and consigned to Germany.

In the cargo of the steamer "Rysbergen," chartered by the Rotterdamse Lloyd, rubber is said to have been found concealed in tobacco, of which 500 packets were consigned to an Amsterdam firm. A workman discovered the rubber and an official investigation is understood to have been started.

AUSTRIAN RUBBER REGULATIONS.

All rubber tires, except those in use and bicycle and horse-drawn vehicle tires, are subject to a new decree issued by the Austrian Government, and sworn statements concerning their kind, number and measurements are to be filed in the proper courts on the first and fifteenth of each month. The object of this decree is to place in the hands of the government full information concerning all available tires. As soon as this information is secured previous decrees prohibiting the sale of tires altogether will be modified so as to affect only such sizes and kinds of tires as are needed for military purposes.

EXPLAINING HIGH PRICES TO GERMAN CONSUMERS.

VERY naturally, the war has caused a great rise in the price of rubber goods in Germany, and the purchasing public has become quite aroused over the matter and has shown a disposition to hold the dealers responsible. In order to assist the dealer in explaining the situation to his customer, the "Gummi-Zeitung" has prepared a circular, which dealers can secure in quantities for distribution to their retail trade. As this circular gives some further light on the rubber industry in Germany today, it is reproduced below:

WHY ARE RUBBER GOODS SO EXPENSIVE?

War, especially when it lasts a long time, results in a rise in the prices of all commodities. This is due to the gradually growing scarcity of raw materials, decreased manufacturing facilities and to the curtailment of production, especially on account of shortage in skilled labor, which has to be replaced by less efficient help. Increased selling and delivering expenses are also responsible. These causes especially affect the rubber branch and increase the price of the finished article.

"When the war broke out, Germany had only a small stock of crude rubber and, through England's joining in the struggle, importations of rubber were stopped almost completely. Then, for military purposes, the army placed its hand on all crude rubber available, allowing only a very small quantity for private use. The same applies to other raw materials used in the manufacture of rubber goods—cotton, hemp, fabrics, coloring materials, chemicals and especially solvents, like benzine and turpentine. Then the price of coal rose tremendously. All this naturally had its effect on the price of rubber goods.

"The curtailment of production is further due to the fact that a great number of trained employes and workmen were called to the colors, and no skilled help was available to take their places. This deranged deliveries and contributed to increase the cost of production of rubber articles.

"The cost of selling and delivering was increased through the shrinkage in communications by rail, the shortage in labor, in horses and wagons for handling freight and the increased cost of traveling.

"Under these conditions no one can consider the general increase in prices as unreasonable, for it is quite impossible to produce and deliver merchandise at former prices. In this connection it is proper to mention the fact that the shortage in raw materials has made the production of many articles an absolute impossibility. These articles being now only obtainable in substitute qualities, consumers will be obliged not only to get used to the increased prices which in the circumstances cannot be avoided, but they will have to resign themselves to substitute qualities, which alone can be produced under present conditions. There is not only war bread, but also war rubber.

Rubber manufacturers are doing all in their power to satisfy the needs of the consumer and prevent the stoppage of the rubber trade. Their efforts cannot be successful if consumers make impossible claims. Consumers must recognize the justice there is in the increased prices."

SUBSTITUTES FOR RUBBER GOODS.

A partial impression in conditions has recently been reported by the German rubber industry, especially in branches manufacturing for the army and navy. The automobile industry, which is closely allied to the rubber business, has turned its attention to manufacturing aviation motors, the demand for which has been constantly increasing since the war began, and much overtime and night work is being done in this line. The manufacture of cables and insulated articles is fairly good.

However, the rubber and the fact that most of it is held by the Government and allowed to be used only for army needs, have obliged manufacturers to abandon altogether the production of many articles. Some of these articles—rubber belts, wheel covers, jar rings, penholders and advertising novelties, which are no longer manufactured from real rubber, are being turned out in imitation of the German rubber industry is growing uneasy about its future in this line of manufacture. It is feared that the consumers will become used to the substitute articles and will not return to the purchase of real rubber goods. These fears have been increased by the fact that when the restrictions were placed upon the use of rubber some of the larger

merchants attempted to purchase all the existing stock of rubber goods in the empire. This situation is considered as very dangerous to the industry, and all rubber manufacturers have been advised to hold their stock in rubber goods and distribute it as widely and equitably as possible among all their customers, so that these goods may not be monopolized and fall into the hands of a few dealers.

THE GERMAN RUBBER SHORTAGE.

The shortage of rubber in Germany is reported by a press correspondent at Copenhagen as being so acute that the government has arranged a special campaign for the collection of rubber articles throughout the empire. Wagons are to be sent through every district to collect all articles of rubber, even down to the baby soother. A report was received several months ago—as mentioned on page 226 of our issue of January—to the effect that new rubber articles other than those coming under the head of absolute necessities were being scrapped for military use.

Another indication of the extreme need of rubber in that country is contained in the report of a firm in Holland which recently received from Germany motor cars equipped with wooden wheels without tires.

WAR AND RUBBER.

The extraordinary conditions under which warfare is being carried on in Europe have created a great demand for atomizers, an apparatus that is produced in a great variety of forms by surgical rubber manufacturers. The excessive dampness of the trenches renders the warmest clothing of little value in protecting the soldiers against diseases of the respiratory organs; and atomizers alone are effective in keeping the passages of the throat and nose in a healthy condition.

Many German rubber manufacturers are devoting the leisure that is forced upon them by war conditions to the study of problems for which they had no time during active business. They are giving careful study to their methods of manufacture, with a special view of making all possible savings in material, time and labor. Further, they are giving unusual attention to the use of waste materials.

THE LEIPZIG FAIR.

The Leipziger Messe, or sample exhibition, at Leipzig, Germany, usually held during the last week of February and the last week of August, opened this year March 1, and continued for 5 days. The buyer for a large New York store, who visited the fair, is quoted as stating that instead of the usual 200 to 300 American buyers, there were but 12 in attendance on this occasion; that because of lack of labor and materials many manufacturers have given up exhibiting, and that the toy trade is in bad condition. In a rubber factory visited, he reports that he was unable to buy rubber balls or rubber goods of any description, but discovered a gelatine ball which has been developed since the war.

GERMAN SURGICAL RUBBER MANUFACTURERS INCREASE PRICES.

Certain decrees of the German war department having made it impossible for manufacturers in that country to continue making a number of surgical rubber articles, the German Association of Surgical Hard and Soft Rubber Manufacturers recently resolved to increase the prices of all the rubber goods they produce—the resolution taking effect March 20. The prices of all hard rubber articles and of all articles made of rubber in conjunction with other materials were uniformly advanced 50 per cent. Soft rubber goods and seamless rubber articles were advanced 75 per cent in price.

AUSTRIANS INCREASE PRICES OF RUBBER GOODS.

Following the decision of the "German Association of Hard and Soft Surgical Rubber Manufacturers," increasing the prices of German manufactured surgical rubber goods from 50 to 75 per cent., Austrian rubber manufacturers have increased their prices for same articles from 50 to 60 per cent.

THE RUBBER TRADE IN JAPAN.

By Our Regular Correspondent.

THE Japanese rubber trade has not escaped the effects of the British embargo on the export of rubber from home and colonial ports. Ceylon and the Straits Settlements have in the past formed the chief source of the Japanese crude rubber supply, and the continuance of the embargo for a prolonged period would naturally have meant serious loss to the manufacturers of this country. The matter was taken up by the foreign and agricultural departments of the Japanese Government and requests made that Great Britain except Japan from the embargo conditions; resulting in an arrangement, effected March 3, by which the embargo has been lifted on rubber exports to Japan, on condition that the government of this country shall control re-exports and also the export of manufactured rubber goods so that they positively shall not reach any enemy country. The ordinance issued by the Department of Agriculture and Commerce, under date of March 3, states that any person desiring to export crude rubber or rubber goods must make application to the Minister of Agriculture and Commerce, naming the variety and quantity of the goods to be exported, the ports of shipment and destination, the name of the consignee and the trade-mark. Any person exporting goods without official permission is liable to fine and imprisonment. Applications for permit to ship goods to British and Russian ports are especially likely to be granted.

The export trade of this country has in the past been chiefly with China, where there is a demand for jinrikisha tires and also a small but gradually increasing trade in rubber tires for bicycles. Chinese roads, however, are not especially suited to bicycles, and until these are improved there will probably not be any very large export of this commodity. So keen a competition has developed during the past year in the Japanese tire trade that one of the large companies—the Dunlop Rubber Co. (Far East) Limited—has changed its policy of distribution and is now seeking an extension of its trade with China rather than among home consumers.

Japanese planters now control in Johore and Borneo 46 plantations on which rubber is cultivated. These plantations cover an area of 92,871 acres, of which 39,045 acres is under cultivation, with 31,813 acres planted. Some of this area was opened as early as 1906, but the greater portion of it, or about 27,750 acres, came under cultivation during 1910 and 1911. The number of laborers employed on these various estates ranges from a very few on the smaller plantations up to 1,053—this latter number being employed on the Batu Pahat Rubber Estate at Suligarten.

The Philippine Islands are represented at the Panama-Pacific Exposition, at San Francisco, by an exhibit in blocks 19 and 20 in the Palace of Agriculture, which comprise about 9,500 square feet. Specimens of rubber grown in the islands are included in this display.

Automobiles to the number of 624, and valued at \$886,416, were imported into the Philippine Islands in 1913, of which the United States supplied about 80 per cent., both in number and value. Tire imports for that year reached a total value of \$180,823, of which a little over 60 per cent. were made in the United States and about 35 per cent. were from France.

In its issue of March 16, "Wileman's Review," published at Rio de Janeiro, has the following paragraph bearing on the preferential import tariff on rubber goods manufactured from Brazilian hard fine:

"There should be no difficulty, the Treasury thinks, in determining by physical tests such as tensibility whether foreign rubber manufactures contain only hard fine or other rubbers. Brazilian laboratories are quite up to the mark, and though not a single apparatus for tensile testing is to be found in the country

are quite capable of getting over a simple difficulty like that by simple intuition. The real test, we imagine, will be the tensibility not of rubber, but of the fiscal consciences, proverbially elastic."

RUBBER EXPORTS FROM BOLIVIA.

Rubber to the amount of 5,143,214 kilos (11,335,044 pounds) and valued at 14,651,647 bolivianos (\$5,699,491) was exported from Bolivia in 1913, distributed largely as follows:

To.	Quantity.	Value.
Belgium pounds	970,489	\$510,810
France	2,265,511	1,034,339
Germany	1,941,836	1,013,263
Great Britain	5,714,818	2,900,180
United States	385,920	209,873

RELATIVE VALUE OF DIFFERENT GRADES OF PLANTATION RUBBER.

Opinions differ as to the relative value of the several types of plantation rubber. However, during 1914 ribbed smoked sheet always brought better prices than other grades of plantation rubber and, although it is probable that this rubber is only superficially smoked, the smoke must as a rule improve the quality of the rubber. Otherwise the prices paid for ribbed smoked rubber would have to be considered as artificial.

The smoking process is expensive and attended with considerable fire risk, and planters would be glad to avoid it were they sure that in doing so they would not lower the quality and consequently the price of their rubber.

A NEW FUNGOID DISEASE AFFECTING PLANTATION RUBBER.

The Experiment Station at Peradeniya, Kandy, is now studying another fungoid disease which attacks *Hevea Brasiliensis* as well as a number of other plantation plants. This disease appears to have been imported into the island with different exotic plants and the first case of its attacking *Hevea* was reported in 1907, when it killed three large trees about 25 years old, one 12 years old and several younger plants of this species. This disease also affects *Hevea* in the Federated Malay States, but in no case, either there or in Ceylon, has it caused any widespread damage. It attacks the leaves and finally destroys the tree.

TRADING DIRECT WITH BATAVIA.

The Batavia Chamber of Commerce and Industry would like very much to establish direct communication with the United States. In a communication recently sent out from that body it says that "direct commercial and shipping relations between the United States and Dutch East India are under the present circumstances and for the future most desirable. The trade in several articles which was formerly transacted through the intermediary of Amsterdam and Rotterdam, such as rubber, cocoa and hides, is now impossible, owing to the difficulty of shipping such goods to Holland."

The communication goes on to state that the Dutch East Indian colonies would profit by the direct import of flour and machinery and other commodities exported in large quantities from the United States, and it concludes with this paragraph:

"We are convinced that a direct steamship line between Batavia and New York will doubtless be a great benefit to the commercial relations between the two countries."

From Java and Madura exports of crude rubber, in 1914, aggregated 581,973 pounds, against 543,337 pounds in 1913; showing an increase of 37,742 pounds. For both years *Castilloa* furnished the most important figures, *Ceara* ranking second, and *Hevea* third, while *Ficus* furnished 13,200 pounds in 1913 and 8,800 pounds in 1914.

Some Rubber Planting Notes.

RUBBER EXPORTS FROM THE FEDERATED MALAY STATES.

ACCORDING to a cablegram from the government to the Malay States Information Agency, the exports of rubber from the Federated Malay States for the month of March amounted to 3,418 tons, as compared with 3,411 tons last month and 2,418 tons in the corresponding month last year.

Appended are the comparative statistics.

	1913.	1914.	1915.
Total exports	21,131	2,542	3,473
Federated Malay States	12,757	2,364	3,411
Malaya	8,374	1,178	3,418
Sumatra	8,025	7,324	10,302

RUBBER INDUSTRY IN THE FEDERATED MALAY STATES.

In the Federated Malay States there were, in 1913, 734 rubber estates, comprising 830,078 acres of ground, of which 433,324 acres were planted in rubber; and during the year 53,131,904 pounds of crude rubber was exported.

The fall in the price of rubber has obliged plantation companies to carefully study their production costs, and well situated estates are now able to place their product on the market at an all-in cost of less than 1 shilling per pound.

Such a low figure is said never to have been reached in Sumatra, where the record for low cost of production is held by the Anglo-Sumatra Co., whose total cost of production works out at about 31 cents (American gold) per pound. For Sumatra an income tax takes the place of the Malayan export duty.

The estimated yield of the producing plantations in the Federated Malay States, for 1913, was 275 pounds per acre, and 201,207 laborers were employed on these plantations.

V-TAPPING IN THE EAST.

A few years ago when the yields of many Eastern rubber plantations were far from being satisfactory, V-tapping was recommended. A big V encircling half the tree was to take the place of herring-bone and other systems. This was practically returning to the first method adopted when *Hevea* was being experimented on by scientists and planters in the Middle and Far East. Many opposed this return to V-tapping and their contention set further experimenters to work, with the result that V-tapping appears to be now giving way to the herring-bone system.

GERMAN NEW GUINEA CO.'S RUBBER PLANTATIONS.

The annual report published in Berlin on March 30, by the German New Guinea Co., states that the company's plantations produced but 39,194 pounds of rubber of all sorts during the year 1913-14, showing a decrease in production of more than 10,000 pounds. This was due partly to the fall in rubber prices but especially to shortage of labor brought about by a very severe epidemic among the coolies. The German New Guinea Co. is replanting great areas of rubber plantations by cocoanut groves. In some parts of its estate this company has interplanted cocoanuts with rubber, and in all cases the rubber has only been preserved where conditions are most favorable and where the trees produce especially high-class rubber.

THINNING OUT THE TREES.

Many estates in the low country of Ceylon are thinning out their rubber plantations and reducing the number of trees to about 100 per acre. Experience in planting in this district has shown the advantage of thinning out the over-planted areas. Reduction of the number of trees in shaded plantations has three advantages—actual increase in the yield of latex per given area, reduction in cost of collection and in labor force, and lastly, greater freedom from the ravages of fungoid pests.

RUBBER IN CEYLON IN 1914.

From January 1 to December 31, 1914, 35,318,269 pounds of native crude rubber was exported from Ceylon, as against 25,433,551 pounds during the same period of 1913; showing an increase of shipments of 9,884,718 pounds. Considering statistics from August 1 to December 31, 1914, during each of these five months, in spite of the fact that the war was in progress, the exports of rubber from Ceylon were much heavier than for the corresponding period of the previous year—the aggregate increase amounting to 4,709,396 pounds. Although public auctions were suspended at the commencement of the war, and in spite of the fact that figures representing private sales of rubber are unavailable, statistics in hand show that 13,334,557 pounds of rubber was offered at public auction in Ceylon during 1914, as compared with 12,013,824 pounds in 1913 and 6,260,026 pounds in 1912. Diamond-pattern smoked sheet was most in demand and was at a premium over other rubbers throughout the entire year. In fact all good rubber was well sold, but there was a very small demand for the poorer qualities. The great European war has had but comparatively little effect upon the Ceylon rubber industry.

ACETIC ACID FROM COCOANUT SHELLS.

A number of people in Ceylon have been experimenting in the manufacture of acetic acid for rubber coagulation, but the only place in the island where the manufacture of this coagulant has been carried on in a systematic manner is on the estate of the Pitakande Tea Co. (of Ceylon) Limited. This company obtains its acetic acid by the destructive distillation of cocoanut shells, and all the latex collected (which amounted to 72,747 pounds in 1914) is coagulated with acetic acid produced on the spot. The Pitakande company contemplates manufacturing acetic acid on a much larger scale and is providing itself with the proper machinery for this work.

FREIGHTAGE AT COLOMBO.

According to representations made to the Ceylon Association in London, by the Colombo Chamber of Commerce, considerable inconvenience is being felt in Ceylon through the shortage in freightage created by the war. This is due to the British Government's commandeering a great number of ships for military purposes, to the sinking of a certain amount of tonnage and to the withdrawal of all German bottoms. Many German ships captured as prizes have been set to work, but a great number are interned in neutral ports and therefore unavailable for freightage.

So far as rubber is concerned, this shortage in shipping facilities has not as yet been keenly felt, but unless there is some improvement between Calcutta, Colombo and New York, trade with North America will suffer severely. Bulky merchandise requiring more bottom room than rubber is badly affected by the lack of freightage.

In January, 1915, 3,473 tons of crude rubber was shipped from Port Swettenham, Selangor, as compared with 2,542 tons during the corresponding month of 1914. Rubber shipments from Port Swettenham amounted to 2,131 tons during February, 1913, as against 1,200 tons shipped from there during the second month of 1912.

The United States consul stationed at Teneriffe reports that, according to official statistics, rubber and manufactures of rubber to the value of \$73,242 were imported into the Canary Islands during 1913; while the estimate for 1914, based on information supplied by leading importing firms, is given as \$65,658.

1,134,177 Fuel mechanism for mixing, C_2H_5 , P. I. Weltin, and R. I. Kohnen, E. Weltin, and R. I. Kohnen, *Am. Ch. Soc. Div. Org. Chem.*, 84, 137
1,134,178 Fuel mechanism for mixing, C_2H_5 , P. I. Weltin and R. I. Kohnen, assignors to K. I. Kohnen, R. I. Kohnen, and P. I. Weltin, *Am. Ch. Soc. Div. Org. Chem.*, 84, 138
1,134,179 Machine for covering and sheeting, C. J. Lurie, R. C. Lurie, assignors to Easton W. A. H. Co., and Rubber Co., Inc., both in Massachusetts
1,134,180 Bolt, C. S. Smith, Providence, R. I., W. H. Theroux, Providence, R. I., administrators of said Smith, deceased

Review of the Crude Rubber Market.

NEW YORK.

April 30, 1915.

THE congestion at the Cunard docks became so serious early in April as to require the service of additional dock-men to release the accumulating rubber. Complaints, however, are still heard that the service is not as prompt and efficient as it should be. The market for the first week was very quiet. Upriver fine stood uniformly at 57 cents, while First latex crépe and Smoked sheet ribbed were quoted at 61 and 62 cents, respectively. On the 6th of the month a somewhat firmer tone developed, Upriver fine moving up to 58½¢/59 cents, while First latex crépe and Smoked sheet ribbed were marked up to 64 and 65 cents. Upriver fine advanced another point, selling on the 8th at 59¢/60 cents. The second week brought plenty of inquiries, and although it was apparent that the manufacturers were well supplied, prices stiffened considerably. There was practically no spot plantation rubber. First latex, April-May delivery, sold at 60 cents, and Smoked sheet ribbed, April-May delivery, brought 61½ cents. The unusually heavy rains on the Upper Amazon have held back the usual rubber receipts from the interior. London's reserve stock is apparently getting low, and buying for European account has advanced the New York prices of Brazil sorts. By the middle of the month Upriver fine, spot, was selling in a firm market for 61 cents, and quotations for future delivery were not obtainable.

The hardening of the market during the second week of the month was not because of any urgent demand on the part of the manufacturers, but rather because of the slowness of deliveries, due chiefly to inadequate shipping facilities, but partly also to the dock troubles in London and to the fact that shipments were received at New York in such confused state that the assortment of lots consumed an unusual length of time.

For the last two weeks of the month the market has been quiet and dull. There were inquiries, but little business beyond that of a routine sort. Prices were irregular and only small lots were bought. The impression is that the manufacturers are well stocked for the time being and are looking forward to lower prices.

In spite of the unsettled conditions in Mexico, regular shipments of guayule have been made to the United States. The monthly average for the past five or six months has been 500,000 pounds.

The steamship "St. Stephen" from London with plantation rubber is now here. The steamship "Troper" sailed from the same port April 21, and will arrive at New York in 14 days. The steamships "Langdon" and "Nebraskan" are reported to have sailed from London. All these ships carry rubber.

Direct shipments from Java are now coming regularly. The steamships "R. L.", "Malang" and "Obipek" are en route from Batavia for New York with rubber.

Rubber shipments from Brazilian ports to the United States is as follows: The Booth Line steamship "Gregory," from Iquitos, with 140 tons, is en route to Manaus and Para, and is due in New York May 17. The steamship "Dunstan," of the same line, from northern Brazil coast ports, with 40 tons, is due May 7. The Lloyd Brasileiro steamship "Purus," from Manaus and Para, with 380 tons, is now due. The steamship "Francis" sailed from Para on May 24, with 40 tons of rubber, for Liverpool.

The British steamship "Benedict" sailed from Manaus, April 4, with 2½ tons of rubber for New York. On same day the Brazilian steamship "Para" was loading 83 tons of rubber for the same port.

LONDON.

The first week of April was marked by a strong and active market on the part of the buyers, but the activity of rubber shares.

A fair business was reported and prices were supported by inquiries for quotations on all grades. At the end of the week Standard crépe was 2s. 4½d. for spot, and Smoked sheet was steady at 2s. 5¼d. for spot. Hard Para was firm at 2s. 6½d. Crépe was in demand, especially July-December delivery, at 2s. 3d., while Smoked sheet was selling at 2s. 3½d., a difference of only a little over ½d.

During the second week there was enough activity to steady prices, although actual trading was limited to future deliveries. The reported delay in the issue of shipping permits and the uncertainty of cargo space resulted in an easier market. By the middle of the month Standard crépe was 2s. 4d. for spot, July-December being 2s. 2¾d. Smoked sheet was 2s. 5d. for spot, July-December being 2s. 3½d. Para rubber has steadily shown strength, and advanced prices are quoted for Hard fine, which closed at 2s. 6¾d.

It appears that the abolition of the rubber auctions has had a steadying effect on the London market and has eliminated, at least temporarily, the speculative feature.

According to communications from the American Consul at London, the exports of rubber declared at that port to the United States during the first three months of 1915 were valued at \$13,882,728, as compared with \$9,171,126 for the same period last year.

If the Dardanelles is opened it is quite possible that the British Government will commandeer many ships now carrying rubber and use them as transports. There is a ready market in France and Great Britain for Russian wheat, and ships will be needed for carrying this wheat as soon as the Dardanelles is open, and the result may affect plantation rubber considerably.

The market continued firm and quiet during the last two weeks, with little change. Prices for plantation grades were maintained on a basis of 2s. 3½d. for spot. Standard crépe was offered at 2s. 3d. and smoked sheet ribbed at 2s. 3¾d.

SINGAPORE AND COLOMBO.

Auctions are held regularly and the offerings are taken up promptly and at satisfactory figures. Shipments to London and the United States are delayed for lack of cargo space. The steamship "Indrakuala" from Singapore is due in New York May 5.

Messrs. Keel & Waldo, of Colombo, print the following information in their weekly report, concerning ocean rates: The freight on rubber from Colombo to London is 70s. plus 20 per cent. war surcharge; from Colombo to New York, 92s. 6d. plus 50 per cent. war surcharge, and from Colombo to the Continent, 70s. plus 20 per cent. war surcharge.

NEW YORK QUOTATIONS.

Following are the quotations at New York one year ago, one month ago, and April 30, the current date:

PARA.	May 1, '14.	Apr. 1, '15.	Apr. 30, '15.
Upriver, fine, new.....	74@75	58 @	60 @
Upriver, fine, old.....		59 @60	62 @
Islands, fine, new.....	72@	53 @	53 @
Upriver, coarse, new.....	45@46	46 @	46 @
Islands, coarse, new.....	31@	30½@	30 @
Cameta	35@36	34 @	34 @
Cauchio, upper	45@46	47½@	48 @
Cauchio, lower		44 @	45 @

PLANTATION HEVEA.

Smoked sheet ribbed.....	68@69	{ Spot 65 @	59 @
		{ Afloat 62 @	58 @
First latex crépe.....	67@69	{ Spot 62 @	58½@
		{ Afloat 61 @	57 @
Fine sheets and biscuits un-smoked	62@67		

CENTRALS.				
Corinto	46	a 47	46	a
Esmeralda, sausage	45	a 46	46	a
Nicaragua, scrap	40	a 41	43	a 44
Mexican, scrap	43	a 44	40	a
Mameoba, scrap	37 1/2	a	37 1/2	a
Mangabeira, sheet	40	a	37 1/2	a
Guayule			28	a 29
Balata, sheet			55	a
Balata, block			48	a
AFRICAN.				
Lopori, ball, prime	53	a 54		
Massai, red	49	a 52	52	a 54
Cameroon, ball	35	a 36	37	a 40
Benguela				30 a
Accra, flake	22	a 23	22 1/2	a 23
EAST INDIAN.				
Assam			50	a 5
Pontianak			7 1/2	a

IMPORTS FROM PARA AT NEW YORK.

[The figures indicate weight in pounds.]

MARCH 23.—By the steamer *Huayna*, from Itacoatiara and Iquitos.

	Fine	Medium	Coarse	Cancho	Total
Henderson & Korn	13,500	900	7,400	6,600	28,400
IQUITOS.					
Meyer & Brown				3,400	3,400
H. C. Kupper	3,800		3,800	13,800	21,400
G. Amsinck & Co.	6,000		2,400	8,800	17,200
W. R. Grace & Co.	3,600	300	1,400	3,300	8,600
H. A. Astlett & Co.	4,800		700	7,500	13,000
Total	18,200	300	8,300	36,800	63,600

MARCH 23.—By the steamer *Huayna*, from Pará and Manáos:

Meyer & Brown	133,500	17,600	47,900	138,300	337,300
Arnold & Zeiss	63,800	8,300	100,200	135,300	307,600
Henderson & Korn	78,300	30,900	59,000	132,200	300,400
Johnstone, Whitworth & Co.			26,900	109,900	136,800
Robinson & Co.	110,200	300	22,300		132,800
Hagemeyer & Brunn	24,500		18,800	40,800	84,100
Robert Badenhop	67,200	5,400	4,000		76,600
H. A. Astlett & Co.	28,600	20,700	26,800		76,100
W. R. Grace & Co.	22,200	1,700	2,300	22,100	48,300

CENTRALS.

[*This sign, in connection with imports of Centrals, denotes Guayule rubber.]

MARCH 24.—By *El Mundo*—Galveston:
Various *300,000MARCH 26.—By the *Zacapa*—Colombia:
Schulte, Bunemann & Co. 1,200
Pablo Calvet & Co. 2,500MARCH 26.—By the *Albania*—Colon:
G. Amsinck & Co. 200
Fidanque Bros. & Sons 300
Potberg, Ebeling & Co. 300
W. R. Grace & Co. 27,500MARCH 29.—By the *Gracie*—New Orleans:
E. Steiger & Co. 40,000MARCH 30.—By the *Calamayos*—Port Limon:
Isaac Brandon & Bros. 700
A. A. Linde 300APRIL 1.—By the *Antilles*—New Orleans:
E. Steiger & Co. 35,000APRIL 2.—By the *Colon*—Colon:
G. Amsinck & Co. 5,300
American Trading Co. 2,000
W. R. Grace & Co. 600APRIL 2.—By the *Terence*—Bahia:
Adolph Hirsch & Co. 67,000
J. H. Rosbach & Bros. 160,000
Aldens' Successors, Ltd. 12,000APRIL 5.—By the *Tenadores*—Port Limon:
G. Amsinck & Co. 800
Isaac Brandon & Bros. 700
Gontard & Co. 500APRIL 5.—By the *Sivuala*—Guatemala:
W. R. Grace & Co. 800
West Coast Rubber Co. 700
A. Rosenthal & Sons 2,000G. Amsinck & Co. 2,400
Davies, Little & Co. 5,500

Total 1,571.00

MARCH 26.—By the steamer *Sergipe* from Pará and Manáos:

Meyer & Brown	18,200	3,900	7,180	138,600	285,100
Arnold & Zeiss	27,100	2,200	17,800	127,000	285,100
H. A. Astlett & Co.	10,200	1,000	8,180	2,100	66,300
Henderson & Korn	44,300	17,000	6,200	100	68,100
G. Amsinck & Co.	36,100	3,900	13,200	100	53,300
A. D. Straus	36,300				36,300
Robert Badenhop				21,800	21,800
Various	11,800		43,600	22,200	77,600
Total	187,500	3,900	7,180	1,571.00	1,571.00

Total 1,571.00

ITACOATIARA.

Henderson & Korn 7,000

APRIL 12.—By the steamer *Sio Pau* from Pará:

Meyer & Brown	18,200	3,900	7,180	138,600	285,100
Arnold & Zeiss	27,100	2,200	17,800	127,000	285,100
H. A. Astlett & Co.	10,200	1,000	8,180	2,100	66,300
Henderson & Korn	44,300	17,000	6,200	100	68,100
G. Amsinck & Co.	36,100	3,900	13,200	100	53,300
A. D. Straus	36,300				36,300
Robert Badenhop				21,800	21,800
Various	11,800		43,600	22,200	77,600
Total	187,500	3,900	7,180	1,571.00	1,571.00

Total 1,571.00

APRIL 8.—By the steamer *Sergipe* from Pará:

Meyer & Brown	68,600	3,900	7,180	138,600	285,100
Arnold & Zeiss	27,100	2,200	17,800	127,000	285,100
Hagemeyer & Brunn	151,800		1,000	2,100	173,100
H. A. Astlett & Co.	10,200	1,000	8,180	2,100	66,300
Henderson & Korn	44,300	17,000	6,200	100	68,100
G. Amsinck & Co.	36,100	3,900	13,200	100	53,300
A. D. Straus	36,300				36,300
Robert Badenhop				21,800	21,800
Various	11,800		43,600	22,200	77,600
Total	422,900	40,800	7,180	1,571.00	967,200

Total 967,200

APRIL 17.—By the steamer *Benedict* from Pará and Manáos:

Meyer & Brown	5,700	3,900	7,180	138,600	62,400
Arnold & Zeiss	27,100	2,200	17,800	127,000	159,400
Henderson & Korn	15,800	300	7,800	21,900	117,800
Robinson & Co.	38,900	4,000	600		43,500
Johnstone, Whitworth & Co.			18,000	22,400	41,000
Aldens' Successors, Ltd.	4,000	400	1,500	500	6,400
Cowdrey & Co.	2,100		300	600	4,000
H. A. Astlett & Co.	1,400	1,300	500		3,200
Crossman & Sucklen	4,600	400			5,300
Total	93,600	14,300	7,180	1,571.00	443,000

Total 443,000

ITACOATIARA.

Henderson & Korn 4,700

Goutard & Co. 200

W. R. Grace & Co. 2,500

M. L. Collantes 1,200

Banco Italiano 6,500

APRIL 17.—By the *Rosbach*—Bahia:

J. H. Rosbach Bros. & Co. 2,500

Various 55,000

APRIL 17.—By the *Rosbach*—New Orleans:

G. Amsinck & Co. 1,000

Cowdrey & Co. 1,000

Hagemeyer Trading Co. 2,500

APRIL 17.—By the *Terence*—Bahia:

Various 14,000

APRIL 19.—By the *Terence*—Bahia:

Rosenthal & Sons 700

APRIL 19.—By the *Terence*—New Orleans:

Various 101,000

APRIL 20.—By the *Terence*—New Orleans:

G. Amsinck & Co. 1,000

Isaac Brandon & Bros. 1,000

Fruit Dispatch Co. 2,500

APRIL 21.—By the *Terence*—Galveston:

Various 1,571.00

APRIL 21.—By the *Terence*—New Orleans:

E. Steiger & Co. 1,000

APRIL 23.—By the *Terence*—New Orleans:

G. Amsinck & Co. 1,000

A. M. Capen's Sons 1,000

Pablo Calvet & Co. 2,500

W. R. Grace & Co. 1,000

H. Wolff & Co. 1,000

Lanman & Korn 1,000

Isaac Brandon & Bros. 1,000

Potberg, Ebeling & Co. 1,000

Fidanque Bros. 1,000

M. A. de Leon & Co. 1,000

APRIL 23.—By the *Terence*—Bahia:

Potberg, Ebeling & Co. 1,000

A. M. Capen's Sons 1,000

Winter, Son & Co. 1,000

International Baking Corp. 1,000

Mastland, Corfield & Co. 1,000

Plantation Rubber from the Far East.**EXPORTS OF CEYLON GROWN RUBBER**

From January 1 to March 5, 1914, and 1915. (Ceylon Rubber Exporters' Association, Ceylon Rubber Commerce.)

To—	1914.	1915.
Great Britain	3,483,131	4,143,431
United States	1,034,675	1,034,675
Belgium	1,034,675	1,034,675
Germany	8,438	8,438
Russia	8,438	8,438
Japan	77,848	77,848
France	55,586	55,586
Switzerland	38,818	38,818
Australia	15,688	15,688
India	500	500
Ceylon and North Borneo	—	—

Total 6,804,000 7,448,000

Same period 1913, 4,333,431; same period 1914, 7,631,666.

The export figures for Ceylon in the above table for 1914 include the exports re-exported to the amount of 689,664 pounds. To arrive at the total quantity of Ceylon rubber exported for that period deduct these imports from the total exports. The figures for 1915 are for Ceylon rubber only.

SINGAPORE.

Guthrie & Co., Ltd., rep. (March 9, 1915).

The rubber auction held today established a fresh record as regards quantity catalogued, there being 2,411 tons entered.

A more better tone prevailed and prices all round showed an improvement. Bidding at the outset was slow, but during the course of the afternoon demand became very brisk. Fine ribbed smoked sheet at \$13.00 and pale crepe at \$12.80 showed an increase in each case of \$5.00, last auction. Unsmoked sheet at \$10.00 an increase of \$7.00.

One hundred and thirty nine tons were sold.

The following was the case of values:

	In Singapore, Pical.	Sterling equivalent per pound in London.	Equivalent per pound in cents.
Sheet, fine smoked	\$12.80 @ 13	2 1/2 @ 2 1/2	\$7.57 @ 7.58
Sheet, fine to good	11.80 @ 12	2 1/2 @ 2 1/2	53.46 @ 53.47
Sheet, unsmoked	10.80 @ 11	2 1/2 @ 2 1/2	48.90 @ 48.91
Crepe, fine pale	11.00 @ 12	2 1/2 @ 2 1/2	55.75 @ 55.76
Crepe, good pale	12.00 @ 12	2 1/2 @ 2 1/2	55.75 @ 55.76
Crepe, fine brown	11.00 @ 11	2 1/2 @ 2 1/2	51.18 @ 51.19
Crepe, good brown	9.00 @ 11	1 7/8 @ 1 7/8	42.82 @ 42.83
Crepe, dark	9.00 @ 10	1 7/8 @ 1 7/8	42.82 @ 42.83
Crepe, barked	8.00 @ 10	1 7/8 @ 1 7/8	38.51 @ 38.52
Scrap, virgin	6.50 @ 8	1 5/8 @ 1 5/8	32.18 @ 32.19
Scrap, untreated	7.00 @ 8	1 5/8 @ 1 5/8	35.22

*Pical = 133 1/3 pounds.

Quoted in S. S. dollars. 2 1/2 @ 26 cents.

TOTAL EXPORTS FROM MALAYA.

From January 1 to dates named. Reported by Barlow & Co., Singapore. These figures include the production of the Federated Malay States, but not of Ceylon.)

To—	Singapore, March 6.	Malacca, Feb. 28.	Penang, Jan. 31.	Port-Swet- tenham, Feb. 28.	Total
Great Britain	7,726,463	1,385,559	2,262,933	5,493,794	16,868,749
Continent	725,496	—	106,266	2,240	834,002
Japan	9,067	—	—	—	9,067
Ceylon	50,112	—	73,733	314,028	437,873
United States	2,477,808	—	70,666	—	2,548,474
Australia	65,370	—	—	—	65,370
Total	11,054,146	1,385,559	2,513,598	5,810,062	20,763,365
1914, to Mar. 11	7,145,573	886,290	1,746,266	5,084,254	14,862,383
1913	4,806,621	—	1,027,733	4,218,179	10,052,533
1912	2,161,478	—	699,106	3,233,236	6,093,820

PUBLIC SALES IN COLOMBO, CEYLON.

	Ceylon.	Straits.	S. India.
Sales from January 1 to March 5, 1915	3,848,915	311,159	58,871
Sales made on March 5, 1915	380,079	22,540	—
Total	4,229,094	333,699	58,871
Total sales to March 5, 1915	—	—	4,621,564
Total sales for same period 1914	—	—	3,197,814
Increase	—	—	1,423,750

New York.

In regard to the financial situation, Albert B. Beers (broker in crude rubber and commercial paper, No. 68 William street, New York) advises as follows:

"There has been but little change in the general market for commercial paper during the past three months, and the rates ruling in March can be repeated for April, namely, 4 1/2 per cent. for the best rubber names and 5 1/2 per cent. for those not so well known; the demand from banks continues good."

NEW YORK PRICES FOR MARCH (NEW RUBBER).

	1915.	1914.	1913.
Upper, fine	\$0.58 @ 0.60	\$0.73 @ 0.76	\$0.88 @ 0.90
Upper, coarse	45 @ 47	43 @ 46	44 @ 47
Islands, fine	51 @ 53	48 @ 50	49 @ 52
Islands, coarse	36 @ 38	33 @ 35	34 @ 37
Cameta	34 @ 37	35 @ 36	43 @ 48

RUBBER STATISTICS FOR LONDON AND LIVERPOOL, MARCH, 1915

	Imports, March.	Deliveries, March.	1913.	1914.	1915.
London	8,333	8,333	8,333	8,333	8,333
Liverpool	8,333	8,333	8,333	8,333	8,333

MOVEMENTS OF ALL KINDS OF RUBBER IN THE UNITED KINGDOM.

	March.	Three months ending March.				
1913.	1914.	1915.	1913.	1914.	1915.	
United Kingdom	8,333	8,333	8,333	8,333	8,333	8,333
Foreign	8,333	8,333	8,333	8,333	8,333	8,333

THE RUBBER SCRAP MARKET.

THE first two weeks of April were characteristic by unsettled conditions and an uninteresting market. The signs of firmer market conditions that developed about the middle of the month helped to advance the price of boots, shoes and tires. The white tires in most demand are Goodyear and Goodrich.

There was marked activity during the third week, caused by several heavy orders being taken for immediate delivery. Auto tires were marked up a little higher on heavy buying orders and a good demand for selected white tires was noticeable.

The market in general has been decidedly stronger the last week of the month and prices on all grades with some few exceptions have advanced, particularly on boots, shoes, arctics and auto tires. Inquiries from the mills show more interest than for some time heretofore and there are reports of heavy orders being placed for immediate delivery. In auto tires the demand is principally for selected white brands, while mixed tires are held at nominal prices.

In the Canadian market business during the past month has been hardly sufficient to change prices. Boots and shoes were sold only in small lots, and auto tires were very dull. Toward the end of the month boots and shoes were in better demand and prices advanced. Auto tires showed a slight improvement, while inner tubes are steady. The situation, however, is not what it would be if rubber scrap could be freely shipped to the United States.

RUBBER SCRAP PRICES PAID BY CONSUMERS FOR CARLOAD LOTS.

New York, April 2, 1915.

	Per Pound.
Boots and shoes	7 1/2 @ 7 3/4
Automotive tires	5 1/2 @ 5 3/4
Auto tires	4 1/2 @ 4 3/4
Scrub tires	4 1/2 @ 4 3/4
Neoprene tires	2 1/2 @ 2 3/4
Neoprene tires	1 1/2 @ 1 3/4
Refrigerators	13 @ 13 1/2
Rubber tires	3 @ 3 1/2
Boys' tires	1 1/2 @ 1 3/4
Mixed	10 1/2 @ 11
Mixed	8 1/2 @ 8 3/4
White scrap	11 @ 11 1/2
Natural	16 @ 16 1/2
Mixed	7 1/2 @ 7 3/4
Mixed	2 1/2 @ 2 3/4
Rubber	3 @ 3 1/2
Heavy	3 @ 3 1/2
Mixing	2 @ 2 1/2
Goodrich	8 @ 8 1/2
Goodyear	8 @ 8 1/2
Cameta	4 1/2 @ 4 3/4



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SOME LATE FIRE DEPARTMENT AWARDS.

A contract for 40,000 feet of 2½-inch fire hose was recently awarded to the Manhattan Rubber Manufacturing Co., of Passaic, New Jersey, by the New York City fire department. This company has also received contracts for 3,700 feet of hose for Springfield, Ohio; 3,000 feet for Yonkers, New York; 600 feet for Independence, Iowa; 400 feet for Madison, Wisconsin; and 200 feet for Seneca, Illinois.

The Eureka Fire Hose Co., of New York, has been awarded a contract for 2,500 feet for the fire department of Cleveland, Ohio; 800 feet for the town of Lackawanna, New York, and 600 feet each for Parsons, Iowa, and Catasauqua, Pennsylvania.

The New York Belting & Packing Co., of New York, will supply the city of Madison, Wisconsin, with 500 feet of hose, and the city of Mauston, Wisconsin, with 300 feet of hose, besides fire coats and hats.

The Empire Rubber & Tire Co., of Trenton, has been awarded contracts by the cities of El Paso, Texas, and Leland, Illinois, for 500 feet of hose each, and by Madison, Wisconsin, a contract for 400 feet.

The Bi-Lateral Fire Hose Co., of Chicago, is to furnish 3,000 feet of hose for Atlanta, Georgia, and 300 feet for Marion, Ohio. The New Jersey Car Spring & Rubber Co., of Jersey City, has a contract for 500 feet of hose for Madison, Wisconsin; The B. F. Goodrich Co., of Akron, 600 feet for Marion, Ohio; the Republic Rubber Co., of Youngstown, 600 feet for Marion, Ohio, and the Forest City Rubber Co., of Cleveland, Ohio, 2,500 feet for Cleveland.

Contracts have also been awarded for rubber tires and tubes for New York City fire department equipment, as follows: Globe Tire Co., \$1,285.63; United States Tire Co., \$1,923.10; Firestone Tire & Rubber Co., \$442.26.

A FIRE DEPARTMENT ENGINEER ON RUBBER-LINED HOSE.

In a contribution to the March 31 issue of "Fire & Water Engineering," Frank G. Reynolds, of the Augusta, Georgia, fire department, has the following to say on the subject of fire hose and equipment:

"Two and one-half inch cotton rubber-lined two-ply fire hose manufactured by a reputable manufacturer, under a guarantee for three years against defects, is all that can be expected. Each company with a capacity of 1,000 feet of hose should have a relay of 1,000 feet on the dry-rack at each station. Reserve-wagon at headquarters should be fully equipped with 1,000 feet, ladders, extinguishers, hooks, axes, etc., ready for immediate use. Each engine company should be equipped with a deluge set, with tips 1¼ inch to 1¾ inch."

RUBBER SHARES REACH HIGH FIGURES.

On April 14, the common stock of the United States Rubber Co. sold at 74¾. This is a rise of over 30 points from the lowest price in 1914. This stock sold at 13½ in 1907, but at that time it was paying no dividends.

Early in April the Goodrich common sold at 53¾. Its lowest price last year was 19½.

The following market quotations of the shares of rubber manufacturing companies on April 29 last are furnished by John Burnham & Co., 31 Nassau street, New York, and 41 South La Salle street, Chicago:

	Bid.	Asked.
Amex-Guth Rubber Co., common	285	...
Amex-Guth Rubber Co., preferred	100	...
Firestone Tire & Rubber Co., common.....	92	95
Firestone Tire & Rubber Co., preferred.....	95	98
The B. F. Goodrich Co., common.....	49	49½
The B. F. Goodrich Co., preferred.....	102	103
Goodyear Tire & Rubber Co., common.....	239	240
Goodyear Tire & Rubber Co., preferred.....	104	105
Kelly-Springfield Tire Co., common	134	135
Kelly-Springfield Tire Co., 1st preferred.....	84	85
Kelly-Springfield Tire Co., 2nd preferred.....	130	140
Miller Rubber Co., common	180	188
Miller Rubber Co., preferred	104	105
Portage Rubber Co., common	35	38
Portage Rubber Co., preferred	85	88
Swirebat Tire & Rubber Co.	80	90
United States Rubber Co., common.....	69	70
United States Rubber Co., preferred	107½	108

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anyway.

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Edited by HENRY C. PEARSON—Offices, No. 25 West 45th Street, NEW YORK.

Vol. LII. No. 3.

JUNE 1, 1915.

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Published on the 1st of each Month by

THE INDIA RUBBER PUBLISHING CO.

No. 25 West 45th Street, New York.

CABLE ADDRESS: IRWORLD, NEW YORK.

HENRY C. PEARSON, Editor

Vol. 52.

JUNE 1, 1915.

No. 3

SUBSCRIPTIONS: \$3.00 per year, \$1.75 for six months, postpaid, for the United States and dependencies and Mexico. To the Dominion of Canada and all other countries, \$3.50 (or equivalent funds) per year, postpaid.

ADVERTISING: Rates will be made known on application.

REMITTANCES: Should always be made by bank draft or Post-office or Express money order on New York, payable to THE INDIA RUBBER PUBLISHING COMPANY. Remittances for foreign subscriptions should be sent by International Postal Order, payable as above.

DISCONTINUANCES: Yearly orders for subscriptions and advertising are regarded as permanent, and after the first twelve months they will be discontinued only at the request of the subscriber or advertiser. Bills are rendered promptly at the beginning of each period, and thereby our patrons have due notice of continuance.

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Entered at the New York postoffice as mail matter of the second class.

TABLE OF CONTENTS ON LAST PAGE OF READING.

HAVE WE TURNED THE CORNER?

THE important question is not—Where are you? but—In what direction are you going? The last half of 1914 was undoubtedly a period of very general depression in American business circles but there are now unmistakable signs that, notwithstanding the uncertainty of the European situation, general business conditions in this country are steadily and noticeably improving.

On the 20th of May the members of the New York State Savings Bank Association convened for their annual meeting in New York City. There were 250 members present, representing almost every savings bank in that state. The most noticeable feature of that convention was optimism. The bankers reported that deposits had not only not fallen off but had been constantly increasing during the last few months, having now reached the vast total of \$2,000,000,000 for the state. And recently one of the publications devoted to financial matters gathered reports from 90 different cities representing every section of the country, and these reports quite uniformly stated that while local business conditions were not as good as a year ago they had been growing steadily better since the first of the year.

The condition of the United States Steel Co. is generally assumed to afford a very accurate standard by which to measure the situation among railroads and large industrial corporations, and the earnings of the steel company have grown rapidly since the beginning of the year, being in February 125 per cent. larger than in January and showing in March an increase of 450 per cent. over the January earnings. A large locomotive manufacturing company located in Pittsburgh which has been idle for the last two years has announced its intention of resuming operations on a scale requiring 1,000 workmen. And of equal importance with the improving conditions among the railroads and large industrial corporations are the extremely favorable crop reports given out by the government, showing prospects surpassing any yields in the past—which means great activity through the whole West. The South is rapidly recovering from its prolonged chill of the early fall when the price of cotton dropped so low.

Never before has there been such a balance of trade piling up in favor of the United States. Merchandise exports are going out from this country at the rate of ten million dollars a day or three and a half billions a year, with an estimated balance over imports for the present year of a billion dollars. Plenty of other indications might be mentioned, if these do not suffice, of increasing vitality in the national commercial life. And what is true of business at large is equally true of the rubber trade. Our correspondents from various rubber centers speak of the exceptional activity in manufacturing circles; and the prices quoted on the market for shares of the listed rubber stocks show that the public takes an optimistic view of the earning capacity of the large rubber manufacturing corporations. There certainly are evidences enough that the corner has been turned.

NO ONE CAN PLEAD IGNORANCE.

IF there is any one connected with the rubber trade—even with one of its remote accessory ramifications—who is still ignorant of the terms of the guarantee given by American rubber manufacturers to the British government in order to secure crude rubber from London he must be someone who either can't read or won't read, for the Rubber Club has taken every possible means to familiarize the entire trade with the character of this guarantee. Its terms, which were quoted in full in the February issue of this publication, were laid before all the rubber manufacturers of the United States in January, soon after the Rubber Club, through the Control Committee, had made arrangements with the British govern-

ment for the lifting of the embargo. A little later—in February—the Control Committee sent out a circular not only to manufacturers but to all importers, dealers and brokers, explaining the methods of procedure for securing rubber under the guarantee; and in order that not even the smallest tire retailer should lack full information in this matter the committee sent out another circular, on May 22, to every dealer in automobiles and automobile supplies in the country—sixty thousand all told—repeating the terms of the guarantee and calling attention to the necessity of strict adherence to its conditions.

INDICTMENT OF THE HIDDEN RUBBER SHIPPERS.

EVER since the discovery on February 15 of a large number of bales of cotton waste in which all told about 50,000 pounds of rubber was concealed, intended for shipment to Genoa, the rubber trade has been extremely anxious to learn all the facts of this interesting episode. In commenting upon this occurrence *THE INDIA RUBBER WORLD* in its March issue remarked: "The alertness and energy shown by the Control Committee of the Rubber Club in starting at once upon a thorough investigation of this matter convinced the British officials that the club would do everything in its power to maintain the reputation of the American rubber trade for honesty and square dealing with the British government."

The United States and the British governments were equally interested with the Rubber Club in identifying the culprits and in ascertaining the motive back of this attempt to smuggle rubber out of the country. The efforts of the Federal authorities, in whose hands the necessary action was lodged, have been completely successful. The whole story will be found on a later page of this issue. Five men have been indicted on the charge of conspiracy to defraud the government. One of these men is a lieutenant in the German army, another a German rubber manufacturer, a third a member of a rubber syndicate in Hungary; while the remaining two, though American citizens, are related to the others and in sympathy with the Teuton cause.

This publication has never believed that the attempt to ship this hidden rubber was the work of anyone in the trade looking for the profits that might accrue from such a transaction. The facts which have now all been brought to light prove that it was the work of Germans and Austrians—and their sympathizers—who hoped to be able to supply the home industry with much needed

material, and in that way to assist the home governments. The rubber trade is to be congratulated that the mystery is so thoroughly solved, and solved in a way that permits no suggestion of suspicion to rest on any member of the trade. And the Control Committee of the Rubber Club is greatly to be commended for the valuable assistance it was able to afford the Federal authorities and for the very satisfactory outcome of its work.

RUBBER IN THE SUBMARINE.

THERE were plenty of proofs before the 7th of May of the terrific effectiveness of the submarine, but the sinking of the "Lusitania" on that date brought home to the world as never before the appalling havoc which these unseen fighters of the deep could accomplish. This issue of *THE INDIA RUBBER WORLD* contains a description—written by one who has studied this type of craft not only when afloat and moving on the surface, but when submerged to very great depths—which shows the vital part that rubber plays in the construction and operation of these sub-sea terrors. It requires no technical knowledge to realize that absolute and perfect tightness is the prime essential of submarine construction, tightness not only against the inrush of waters from without but against the escape of gases and electrical power. The whole secret of both the effectiveness and the safety of this sort of craft lies in the total absence of leakage, even of the most minute character. No other substance but rubber would insure the necessary conditions. The strong appeal that the submarine makes to universal attention is not so much because of what it has already accomplished—though its work during the last six months has startled the world—but rather because of the promise its past performance has given of the dominant place it will hold in the naval warfare of the future.

The article on another page will assuredly interest every manufacturer of rubber, and particularly those engaged in producing the type of mechanical rubber goods so essential in submarine construction.

AMERICAN ADVERTISEMENTS BARRED FROM GERMAN PAPERS.

GERMAN trade journals, by order of the Imperial Government, have discontinued the printing of advertisements coming from any foreign country—either neutral or belligerent. An American manufacturer of rubber machinery or rubber supplies of any sort can no longer place his announcement in any rubber publication printed in Germany. The reason is said to lie in the possi-

bility that the innocent-appearing advertisement might conceal a cipher message.

Everyone concedes the marvelous attention to detail that has characterized German military operations, but the cutting off of communications in public prints between the rubber trade of America and other neutrals on one hand and the trade of Germany on the other appears like carrying precaution to rather fantastic lengths. However, the practical effect is not important, for under present conditions, and with the long contraband list, American exporters might be extremely eager to sell and German importers importunate to buy and still the resulting interchange prove quite insignificant.

THE PAN-AMERICAN CONFERENCE.

IT is something like a quarter of a century since Secretary of State Blaine, with that world-wide view which distinguishes the genuine statesman, conjured up the vision of Pan-American union. Since that time there have been many conferences of representatives of the United States and from the republics of the southern continent. These conferences have undoubtedly been of great benefit, as they have served to increase mutual understanding and good will. And they have undoubtedly assisted to some extent in encouraging the growth of commercial relations between North America and South America. But after all, trade is not a question of amity—it is a question of advantage. People will buy where they expect to get the most for their money. And, as stated often in these columns, the reason that Germany and England have secured so preponderating a proportion of the South American trade is to be found in the fact that they were willing to do more to get this trade than we were—because they sought this market with an energy that North Americans were not willing to emulate.

But there is no doubt that the hideous discord now shaking the foundations of Europe has tended to draw all Americans of both continents nearer together and to impress them as never before with the inestimable advantage of international harmony, fraternity and esteem. The doors to the South American market are certainly wider open under present conditions than they have ever been before, and it will be easier for the manufacturers of the United States to find South American purchasers for their products than it has been hitherto. But if this market is to be held permanently it must be held by sending goods especially adapted to South American needs, by offering easy terms and long credits and by financial assistance in the development of South American resources—in other words, by following the course that gave the Europeans entrance into that market and which has enabled them to hold it for so many years.

The establishment of United States banks at various points in Brazil, Argentina and other countries must prove of substantial assistance; and undoubtedly if the merchant marine that plies between the ports of North

and South America sailed under the American flag that too would be helpful, but the goods themselves and the terms on which they are offered are, after all, the vital features. Former Pan-American conferences have been interesting and of considerable sentimental value but still largely academic. This latest conference ought certainly to be followed by practical and tangible results.

THE HEAVY BURDEN OF WAR.

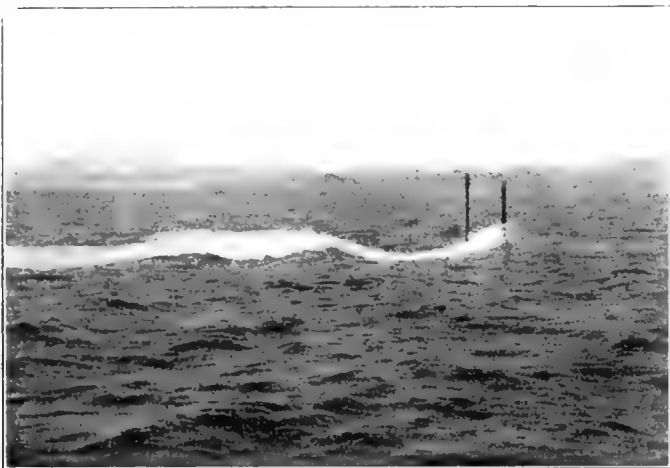
THE general tenor of the messages that come from Germany is to the effect that industries there are being conducted very much as usual, and that the man on the street hardly knows that there is any war in progress, but the glimpses that one may obtain from time to time of the internal situation in that empire indicate that while industrial activity is still maintained it is maintained under conditions that are far from normal. Elsewhere in this number there appears the last annual report, covering the year 1914, of the Continental Caoutchouc & Gutta Percha Co., of Hanover, which is exceptionally interesting because of the unusual items that appear in the expense account. For instance, during the last five months of the year the company expended nearly half a million marks for the maintenance of the families of employees who had joined the army. Other items of expense include payments for cigars and other comforts for troops passing through that section, contributions to German prisoners of war in foreign countries, presents sent to troops in the field, maintenance of hospitals and subscriptions to the Red Cross fund. At the same meeting at which this report was read an appropriation of half a million marks was voted for the support of the families of workmen who had fallen in battle; the amount already paid because of the exigencies of the war, together with the additional sum voted, being in excess of a quarter of a million dollars. All of which shows that while the commercial activities of the empire may be carried on with their accustomed vigor, they are obliged to carry a most unusual burden.

On reading this rubber company's report one is impressed first with the generosity and patriotism of the German industrial corporations; but one's second and most lasting impression is of the great burden that this deplorable war is laying upon the commercial life of all the active belligerents.

THE LAST OF THE AMERICAN HONORARY MEMBERS of the Rubber Club of America passed away in May. John P. Rider and John D. Vermeule, both veterans in the rubber business, both successful, both dating back to the days of Charles Goodyear and the beginnings of the trade, have gone to the Great Beyond. With A. D. Schlesinger and Jacques Huber they were men who did much for the trade, added to its knowledge, and by their enterprise, probity and breadth of view proved themselves worthy members of the great industry to which they devoted their lives.

Rubber's Vital Part in the Submarine.

"The sinister submarine, a two edged weapon." In this fashion has an expert in subaqueous navigation described the under sea boat, and good reason there is, indeed, for this characterization. For some years prior



A SUBMARINE AT FULL SPEED, WITH ONLY HER PERISCOPES SHOWING.

to the present World War the submarine stirred the public mostly when some catastrophe overwhelmed it and the brave men in charge were carried to the bottom and drowned. True, there were instances when some of the crew succeeded in escaping and others were rescued by saving the stricken craft in time, but, as a gruesome rule, the men died at their posts. In our own navy, within the past few weeks, we have had brought home to us the perilous nature of service aboard submarines in time of peace. The fatal plunge of the "F-4" has marked the first of such accidents in our flotilla, and this will give us some idea of the hazards courageously faced by the crews of kindred craft of the nations now at war.

The sea is the submarine's worst enemy—an ever present one, for the deeper it dives into this hostile element the greater the odds against it. The pressure of the enveloping water that prevails near the surface increases with each foot of submergence at the rate of 43 of a pound, and this crushing force exerts itself upon every square inch of the boat's body in touch with the sea. Suppose the submarine is down a hundred feet, then every square inch must sustain a pressure of 43 pounds and every square foot will be subjected to a menacing weight of nearly three tons! Now see how fatal this may prove, taking the ill-fated French submarine, the "Lutin" as an instance.

While performing exercise manoeuvres on the port of Bizerta in 1906, during which the craft probably submerged not more than 60 feet, she suddenly plunged and sank to the bottom in water 118 feet deep, drowning everyone inside of her. The cause of the catastrophe was a stone no larger than a nut, which had unknowingly prevented the complete

closing of a sea valve in one of the ballast tanks. The walls of this tank were not intended to withstand the direct pressure of the sea, and with the valve even slightly open this bursting force became too great at the manoeuvring depths. The steel plates yielded, letting the burden of water into adjacent tanks, and before the commander was aware of it the dead weight of his boat was too great; she dropped to the bottom like a stone, her batteries were flooded, asphyxiating gases generated, and the crew was overcome.

The purpose of the submarine is to approach her target unobserved and in broad daylight to do that which is well-nigh impossible for the speedy surface torpedo boat. The submarine, by sinking beneath the waves, clothes herself for the time being with the water's protecting armor, and when below the surface is absolutely secure against gunfire. But until nearing her naval quarry, the under-sea boat travels upon the surface in what is technically termed her "light" condition. In this state, having free access to the air, she is propelled by means of explosive motors using either heavy oil or gasoline, the newest types having recourse to the safer kerosene. Explosive engines use up air greedily and are therefore unserviceable when the free atmosphere cannot be drawn on, but they are able to drive the submarine at its highest speed along the surface.

For submerged travel the propulsive energy is electricity, furnished by storage batteries, and this motive force must be husbanded, for it has relatively a very limited capacity—submarines being able to run at full speed, and that speed considerably lower than the rate of surface travel, only for about three hours. In order to prepare the boat for an under-water run her surface buoyancy is reduced by admitting tons of water ballast into tanks built for the purpose. When at last ready for submerged work the remaining buoyancy as a rule does not exceed 500 pounds. The boat is forcibly held below the surface by reason of her forward motion and the pressure upon her submerging rudders, and should her engines stop the 500 pounds of reserve buoyancy would cause her to rise. But should leakage accumulate in the course of



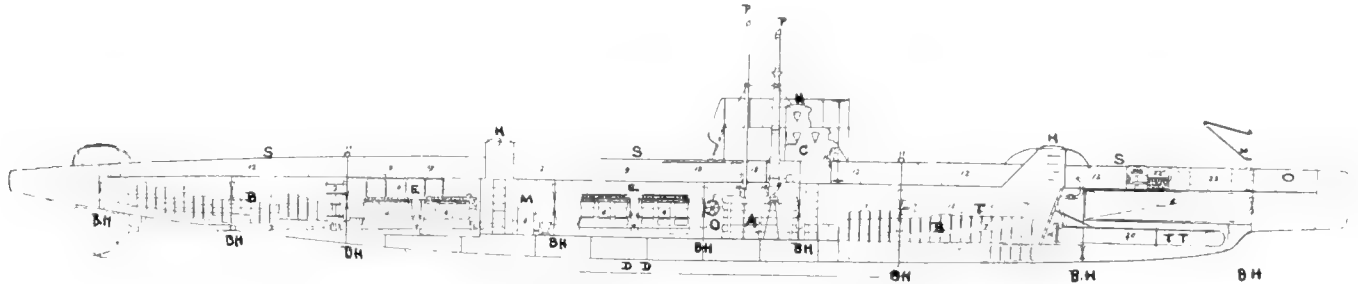
A SISTER SHIP OF THE FAMOUS GERMAN U-9 BOAT.

a run ever so slightly in excess of the original reserve buoyancy, then the craft would have a measure of "negative" buoyancy and would certainly sink upon the stopping of her electric motors.

A gallon of sea water weighs a little over eight pounds, and sixty gallons would be quite enough to wipe out that

buoyant margin of safety of 500 pounds. The greater the pressure impelling water into a passageway, such as a leak, the faster the water will flow, and thus the hazard increases as a submarine goes deeper and any part of her structure yields so that the sea can work its way inward. Therefore, the greatest care must be exercised to prevent leaks and to see that everything is sound and strong enough to withstand the sea's crushing force within certain limits. In the United

The conning-tower forms a separate compartment placed on top of the main pressure-resisting hull of the submarine. In order to isolate this space, in case of accident to the tower, there is a second manhole with bronze top in the floor of this navigational turret, and here, again, the passageway can be sealed by drawing down the lid upon a thick gasket of rubber. One of the two periscopes has its lower end in this chamber, and the man at the wheel uses this instrument in steering



AN INBOARD LONGITUDINAL VIEW OF A MODERN SUBMARINE.

Compressed Air Flues, *B*—Storage Batteries, *BH*—Water-tight Bulkheads, *C*—Conning-tower, *D*—Safety Drop Keel, *E*—Engines, *H*—Hatches, *M*—Electric Motor, *O*—Controlling Room, *P*—Periscopes, *S*—Superstructure, *T*—Torpedo, *TT*—Torpedo Tube.

States navy all of the later under sea boats are required to be water-tight at a depth of 200 feet, and are actually tested by a submergence of that extent before they are accepted by the government from their builders.

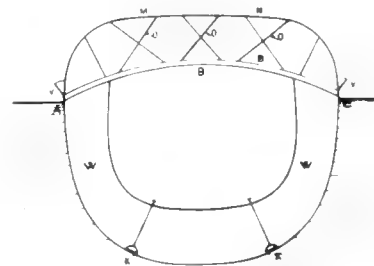
Now, the general reader knows that a submarine must seal itself up tight before it sinks below the sea's surface, yet there must be openings to the enveloping water, but openings susceptible of perfect control. Again, the submarine would be as near-sighted as a human diver plunging into the water but for the optical cunning of modern periscopes. These observing instruments reach above the waves when the subaqueous craft is far enough beneath the surface to be secure from the shot and shell of a foe.

But the reader of this publication may be impatient to know how india rubber helps to make the submarine efficient and how it aids the crew to hold out the insidious sea. Let us start at the beginning by following a craft like one of the German U-boats in her various manoeuvres. While running on the surface, or while alongside the dock, we see that she has a circular hatchway on top of her conning-tower and two or three more of these at points along the crest of her curving deck. The hatch in her conning-tower is the last one to be closed before the boat submerges. The others are for the general passage in and out of her crew and for the loading of stores, ammunition and torpedoes. In order that these openings, when sealed, shall be absolutely watertight, an annular ridge in these heavy metal covers settles deeply into rubber gaskets of the best sort.

Now all modern submarines have two hulls, one that is strong enough to withstand the sea's pressure at any designed working depth and the other which constitutes an envelope or superstructure to which the sea has full access when the craft is submerged. This superstructure or outer hull gives the boat its ship-shaped form, which makes the vessel more seaworthy and capable of being driven at high speed when traveling on the surface. In this latter condition, i. e., "light" trim, water must be kept out of the superstructure or double hull space lest the submarine be made hard to handle by the surging of such water in partly filled spaces. Accordingly, all of the openings in this outer body or shell are made tight by seatings of rubber. In the U-boats of the German navy this double hull space is used extensively for the stowage of fuel, and as the oil is consumed by the engines water is admitted to make up the deficit, so that the tanks are always filled and no air pockets are left for the sea's pressure to push against and to crush at the deeper operative depths.

toward his target when the boat is below the surface. In order that the observing instrument may be rotated and yet not leak, it passes up through a stuffing box packed with rubber. That certain of its lenses shall not be fractured by an ordinary jar, they, too, are set in beds of soft rubber, and that the steersman may not bruise his cheek-bones and brows when looking into the periscope there are rubber cushions attached to the eye-pieces. The other periscope, reaching up from the controlling room below the conning-tower, duplicates the features we have just described save that it passes through a second rubber-packed, water-tight stuffing box on its way up through the main hull or floor of the conning-tower.

Before we take up the propelling motors of one of these U-boats, let us have a glimpse at the bow and the stern torpedo tubes. Generally, before leaving her base, the submarine places a torpedo in each of her tubes; and that these rather delicate weapons shall not rust there, the tubes are kept dry until just before the commander is ready to expel them. Therefore, each torpedo tube must have an outer and an inner door. These doors are firmly seated against annular gaskets of heavy rubber. To launch the torpedo, the outer door is released and swung clear; the tube fills with water from the sea, and at the desired moment compressed air is



CROSS SECTION VIEW OF SUBMARINE HULL.

External Hull, *B*—Internal Hull, *C*—Conning Tower, *D*—Safety Drop Keel, *E*—Engines, *H*—Hatches, *M*—Electric Motor, *O*—Controlling Room, *P*—Periscopes, *S*—Superstructure, *T*—Torpedo, *TT*—Torpedo Tube.

blown in at the rear of

the tube—the pressure being sufficient to force the torpedo out and to trip the little lever which sets the engine of the "steel fish" going. The torpedo itself is divided into three parts—the war head containing the explosive, the middle body holding the pent up compressed air for propulsive purposes, and the after section containing the motors to operate the twin screws and the steering and depth-regulating mech-

anisms. The forward and after parts are joined to the central body and made water-tight against rubber collars, and rubber gaskets and packing figure elsewhere in this sinister instru-

ment of destruction. The almost uncanny working of the depth-regulating apparatus relies largely upon a diaphragm of rubber, and this is the part of the torpedo that makes certain of the weapon hitting the dreadnought below the armor belt. But the tube must be reloaded, and to that end another torpedo is run on a rubber-tired truck right up to the rear of the recently emptied cylinder. The water is drained from the tube into a tank provided for the purpose, that weight taking the place aboard of the submarine of the torpedo just fired—in this way preserving the nice equilibrium demanded in craft of this sort. With the water out of the cylinder then the rear door can be opened and the second torpedo inserted. With this done, the door is swung to and, like its companion at the outer end, is seated against a thick cushion or gasket of soft rubber.

As we have already said, the motive power when running at the surface is provided by internal combustion engines. The exhaust gases from these motors are heavily charged with carbon dioxide and would soon sicken, if they did not asphyxiate, the crew inside of the boat if there were leakage within the engine room. Therefore, the openings into the crankpit, the air intakes exposed to back explosions, etc., must be rendered gas-tight, and, as a rule, manhole plates, check valves and certain of the joints in the exhaust system are secured by rubber packing. But it is in the electrical installation of a submarine that india rubber figures most, and there is the amplest reason for this. Take, for instance, a German submarine of 300 tons submerged displacement. A craft of this sort was the U-9 that sent the three British cruisers, the "Hogue," "Aboukir" and "Cressy," to the bottom. To drive such a boat submerged there are two electric motors, each of 320 horse-power, and the propulsive energy for these motors is supplied by two extensive

ments of this insulation for electric circuits, the rubber coating is obliged to show a dielectric strength sufficient to resist rupture when exposed to an alternating current of 1,500 volts applied continuously for a minute. To guard against physical injury, these heavy-power cables are covered with lead. These



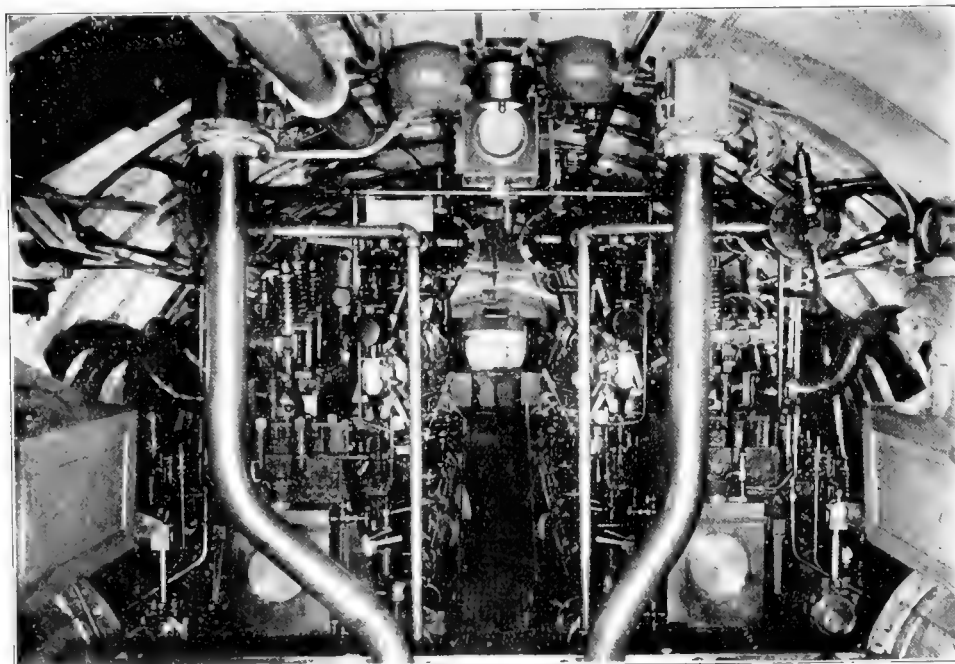
A RUSSIAN SUBMARINE. THREE OPEN HATCHES ARE SHOWN, AND IN TWO COVERS THE DARK LINE OF THEIR THICK RUBBER GASKETS CAN BE SEEN.

precautions are very necessary, because the conductors must be both water-tight as well as secure against electrical leakage.

A submarine is a veritable magazine, and the men aboard face explosive perils of various sorts. Aside from the gun-cotton in the warheads of the torpedoes, compressed air for various operative purposes is stored in metal flasks at the explosive pressure of more than 2,000 pounds per square inch. Should one of these tanks rupture it would constitute a formidable destructive agent. Next, the gases given off by the fuel, when mixed with sufficient air, are highly inflammable and explosive. Further, the hydrogen, emanating from the storage batteries when the accumulators are nearly charged, or at certain periods during their discharge, will ignite in the presence of a spark and exert a violent rending force. Therefore, there must be no fuel leaks nor a chance for battery gas to gather in any quantity within the boat, and, equally vital, electric sparks due to faulty insulation, switch contacts, etc., must be sedulously prevented.

On more than one occasion lives have been sacrificed or serious injuries incurred by the explosion of battery gas. In order, therefore, to keep this dangerous hydrogen from getting into the body of a submarine from the accumulator compartments, until lately the deck

immediately over these spaces was made tight by means of a rubberized cloth; but this has been very much improved upon in the battery installations of the newest of submarines. There are two things which are to be avoided, the escape of the hydrogen into the living space and also the presence of minute particles of sulphuric acid carried off with the bursting bubbles of the electrolyte. These tiny drops of acid



HOW THINGS ARE CROWDED IN THE ENGINE ROOM OF A SUBMARINE. THE STORAGE BATTERY SPACE IS UNDER THE PLACE WHERE THE CAMERA STOOD.

groups of storage batteries.

It should be perfectly clear that current of this capacity flowing from accumulators to motors in the narrow confines of the steel body of a submarine must be extremely well insulated in order to guard against leakage and the dire consequences of a short circuit. Here is where rubber serves as nothing else can. To give some idea of the broad require-

irritate the lungs and the mucous membrane of the nose and throat. In order to arrest the acid particles the vents in the cell tops now contain pieces of sponge rubber, and these devious passages catch the misty electrolyte, condense it, and cause it to fall back into the accumulator instead of passing upward into the boat.

But the hydrogen is disposed of in another way. This gas is no longer allowed to escape into the battery compartment to be drawn off thence by ventilating fans and forced outward through suitable conduits. It has been found that the so-called air-tight deck and rubber cloth are not sufficiently impervious as they are laid, and therefore a more effectual system is employed by which every cell is dealt with separately. In a 300-ton submarine of the German U type there are probably quite a hundred and twenty individual accumulators, and these are distributed equally in two battery compartments. At Hagen, Germany, is manufactured the well known Tudor battery for submarines, and a typical cell should be of interest to the india rubber trade.

To begin with, the containing jars are made of hard rubber. This must be of excellent quality and thick enough to stand up under the service strains encountered in a sea going craft of the submarine order. Each jar will average about 40 inches high with a horizontal cross section of something like 14 x 20 inches. The sides are 7/16 of an inch thick while the bottoms are 1/2 inch thick and provided with footings of semi-hard rubber. Each cell holds 23 plates—11 positives and 12 negatives—and these lead elements are separated one from another by two corrugated hard rubber separators. But this does not end the hard rubber parts.

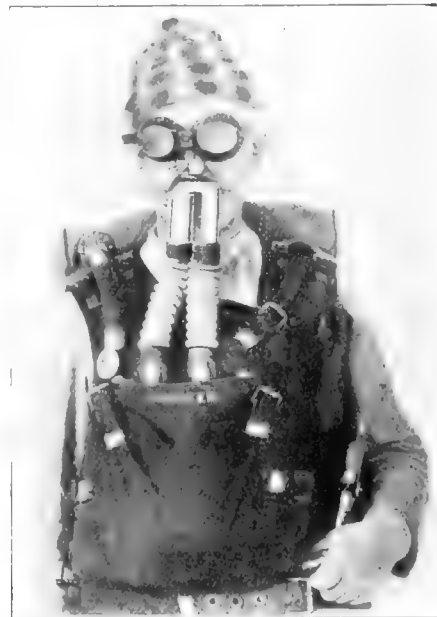
Each jar has a hard rubber cover which fits so snugly upon the top of the cell that it is gas tight, and in this top there is an inlet vent and an outlet trap which serve to prevent the spilling of the electrolyte when the submarine rolls, provided it does not heel over more than 15 degrees from the vertical nor with a rhythmic frequency of more than 5 seconds for a complete swing from side to side. It is said that an occasional

roll of 30 degrees will not cause the electrolyte to spill. Of course, these hard rubber covers are removable. But in order to take care of the escaping hydrogen a flexible rubber hose conduit is attached to each jar, and, in turn, connected to the ventilating main operated by forced draught. In this manner, and by dealing with the jars separately, the explosive hydrogen is drawn off as it gathers and expelled before it can accumulate and do harm.

Now the reason

men put up in such a craft. Its generation, once the acid and the sea water meet, is very rapid, and this probably accounts for many disasters in boats of this sort despite certain safety features. The men were stupefied before they could act for their own security.

It is to obviate just this danger that the United States navy will shortly install Edison batteries aboard one of the newest submarines, now building. But even so, this will not eliminate the service of rubber as an insulator between the plates. The jars or containers are made of metal, while the electrolyte is an alkaline solution instead of sulphuric acid. In one of the Edison pamphlets this caution appears: "Never bring a lighted match or other open flame near battery." Therefore, while this form of accumulator



THE BREATHING AND LIFE-SAVING APPARATUS WITH WHICH THE CREWS OF GERMAN SUBMARINES ARE PROVIDED.

disposes of the danger of chlorine it apparently does not do away with gassing, and we shall probably find that the same system of rubber tubing for ventilation will be required for these batteries when installed in submarines. These additional details about the new storage battery appear in one of the pamphlets issued by the Edison company. "The terminal posts are effectually insulated from the cover by means of hard rubber washers and bushings. A soft rubber washer, used for packing to prevent solution from creeping, also serves as an insulator. This packing washer is held down by a heavy hard rubber bushing threaded into a pocket on the cell cover. The rubber bushing at the positive pole is red in color while that at the negative pole is black."

Besides operating the motors for submarine propulsion, electricity is the motive energy for certain of the pumps—especially for those that must operate in draining the ballast tanks to obtain buoyancy should the boat go to the bottom in 200 feet of water. The steering gear and the diving rudders are functioned by electricity, and so, too, are the periscopes rotated. Electricity does the cooking, and, under some circumstances, the general heating; and the storage batteries supply the needful current for the incandescent lighting system and the wireless. Rubber insulation is provided for all of these conductors and hard rubber plays its part at the switchboards and at points in the get-up of the various motors.

Up-to-date submarines are now divided into a number of water-tight separate compartments, so that in case of injury to the hull admitting water the damaged space can be isolated and the crew seek safety in the adjacent unharmed spaces. This means that every one of these separating bulkheads must have a door that can be swung to and sealed water tight, and to this end gaskets of india rubber are indispensable. Again, access must be had, from time to time, into the various ballast tanks and fuel spaces so that the inside surfaces of



PERISCOPE OF A GERMAN UNDERSEA BOAT

for water-tightness in a submarine's storage batteries is to prevent, if possible, the generation of chlorine gas, which uniformly follows when sulphuric acid and sea water commingle. Chlorine gas is destructive to life, and a gallon of this in the free space inside of an average sized under sea boat would suffice to intoxicate and then to asphyxiate the

the plating can be examined to see that rust is not eating away the steel and reducing its powers of resistance against the pressure of the sea when traveling deeply submerged. These manholes have bolted covers, and to make them absolutely water-tight they are screwed down against gaskets of rubber.

In order to increase the element of safety, the latest under-sea boats are provided with salvage buoys which rise to the surface when released by a trigger worked from within the craft. These buoys are connected with the sunken boat by an armored rubber hose through which air can be pumped down from the surface, and insulated in the walls of this hose are the circuits for a telephone and an electric signal light. But rubber also is used in the special escape helmets and dresses now supplied for each member of a submarine's crew. These helmets are a modification of the fire and mine rescue helmets which we have recently described, and they have an air regenerating apparatus which will supply air for the wearer for at least an hour. The purpose of these helmets is twofold: First, they make it possible for the crew of a submarine to work in a vitiated atmosphere and, even in the presence of chlorine gas, to take steps for the refloating of the boat, which might be out of the question without this protective covering, and, second, they enable the men, under some circumstances, to work their way out of a completely flooded submarine so that they can rise to the surface provided the depth of water be not too great.

The batteries of an under-sea boat require frequent inspection as well as the removal from time to time of the damaged plates. The men must use acid-proof rubber gloves for this work, and the hands must be similarly protected when manipulating live circuits. In refilling the battery jars with electrolyte, or when collecting acid that may have been spilled over into the lead-lined accumulator space, a special pump is employed, and here again rubber tubing is demanded. At various points, where heavy doors swing, rubber buffers are fitted, and, again, at certain places where a firm footing must be assured, corrugated rubber mats are provided. Finally, work aboard a submarine is a wet business, and therefore most of the crew are supplied with high rubber boots and rubber storm coats and caps. Relatively small as a submarine is, still its dependence upon rubber is very extensive, and the amount of rubber used in this way is bound to increase rapidly because of the striking proof the submarine has given of its terrific effectiveness.

"PERMA"—A GOLF BALL PAINT.

A rubber paint for golf balls, which increases their cost only about \$1.50 a dozen and which is said to render them good for at least a hundred holes, is one of the season's new features in golf ball manufacture. This paint has been introduced under the registered trade name "Perma," and under the claim that it increases the elasticity of the ball, causes it to cling to the surface of the club and enables one to make straighter and more certain plays. It can be scrubbed with soapy water and a brush until it has a fresh, new appearance.

The same manufacturers have also brought out a new golf ball, the "Honor," the first ball to carry "Perma" paint. [A. G. Spalding & Bros., New York.]

THE "NON-SEPARABLE" BALATA BELT.

A new balata belt is being introduced differing in construction from the old style in that it has for its base a solid woven fabric balata impregnated. It is claimed that this new type of balata belt is very strong, pliable to a high degree, and that it will not open up under any condition of work. It has no seams to split, and is recommended for economy in use. It is made in four styles—light, single, medium and heavy—for different varieties of work. [W. H. Salisbury & Co., Chicago.]

RUBBER STATISTICS FOR THE UNITED STATES.

IMPORTS OF RUBBER AND MANUFACTURES OF.

ARTICLES.	March, 1915.		Nine Months Ending March, 1915.	
	Quantity.	Value.	Quantity.	Value.
India rubber, etc., and substitutes for, and manufactures of:				
Unmanufactured—				
Balata .....pounds.....	159,942	\$58,333	2,098,084	\$821,533
Guayule gum	689,278	193,015	3,534,012	1,021,559
Gutta percha	299,571	11,043	10,449,033	494,490
Gutta percha	48,002	12,581	1,020,083	155,060
India rubber	26,035,791	12,515,091	116,506,851	\$4,800,558
India rubber scrap or refuse fit only for re-manufacture	346,724	17,116	7,636,001	504,877
Total unmanufactured.		\$12,807,179		\$57,798,077
Manufactures of—				
Gutta percha .....dutyable.....		\$230		\$10,523
India rubber		49,918		660,382
Total manufactures of.		\$50,148		\$670,905
Substitutes, elastic and similar .....dutyable.....		\$216		\$24,775

IMPORTS OF CRUDE RUBBER BY COUNTRIES.

From:				
Belgium .....pounds.....			1,902,370	\$950,872
France	3,719	\$2,095	616,608	259,178
Germany			732,118	358,088
Portugal	821,401	316,452	2,619,520	855,448
United Kingdom	11,527,571	6,017,731	47,377,134	24,346,765
Central American States and British Honduras...	215,068	83,657	604,675	252,197
Mexico	67,794	24,833	1,352,666	512,330
Brazil	8,323,919	3,713,016	38,498,988	16,119,190
Other South America.....	1,315,799	539,621	3,781,306	1,634,992
East Indies	1,282,523	636,165	14,028,940	6,783,925
Other countries	2,467,997	1,181,521	4,992,526	2,727,623
Total	26,035,791	\$12,515,091	116,506,851	\$4,800,558

EXPORTS OF AMERICAN RUBBER GOODS.

India rubber, manufactures of:				
Scrap and old.....pounds.....	139,422	\$24,248	1,492,063	\$164,055
Reclaimed	507,044	84,441	4,411,051	612,881
Bolting, hose and packing.		101,020		1,341,316
Boots and shoes—				
Boots	6,894	18,444	304,905	689,803
Shoes	130,510	62,563	1,903,906	1,901,561
Tires—				
For automobiles		627,505		2,887,608
All other		54,642		302,919
All other manufactures of.		340,138		2,209,997
Total		\$1,313,001		\$10,110,140

EXPORTS OF AUTOMOBILE TIRES BY COUNTRIES.

Tires for automobiles:				
France				\$6,090
England		449,560		1,530,701
Canada		50,000		464,392
Mexico		8,332		73,349
Philippine Islands		3,384		160,631
Other countries		116,229		652,445
Total		\$627,505		\$2,887,608

EXPORTS OF FOREIGN MERCHANDISE.

India rubber, etc., and substitutes for, and manufactures of:				
Unmanufactured—				
Balata .....pounds.....	79,309	\$28,301	849,064	\$328,440
Gutta percha			3,460	1,488
India rubber	568,069	294,342	5,415,639	2,884,382
Total unmanufactured.		\$322,643		\$3,214,310
Manufactures of india rubber .....dutyable.....		\$6		\$5,448
Substitutes, elastic and similar .....dutyable.....		345		345

A PENCIL FLASH LIGHT.

A New England company is manufacturing a novelty in the form of a combination pencil and flash light, a small device that can be carried in the pocket without inconvenience. Instances where such an invention could be made useful are numerous, as it affords means both for writing and seeing what is written. A small rubber insulator is used in this device, and to obtain a light it is necessary only to push the pencil into writing position. [Hawthorne Manufacturing Co., Inc., Bridgeport, Connecticut.]

Substitutes for Hard Rubber.

CHARLES GOODYEAR, in discussing hard rubber, the invention of Nelson Goodyear, is said to have characterized it as a material so unique and valuable that it would never be successfully counterfeited. Nearly 70 years



Benton Rubber Mfg. Co.

MECHANICAL TESTING APPARATUS FOR BAKELITE.

have passed and his prophecy has been strikingly verified. Whether crude rubber has been sold at 50 cents or \$3 a pound, hard rubber manufacture has not only continued but the business has shown a steady growth. While vulcanite has not had the wide range of usefulness that soft rubber has enjoyed, its field is a wide one. It is the insulator most desired for electrical instruments of all sorts in telegraph, telephone and wireless lines. It finds also a special use in surgical and stationers' goods, in scientific apparatus, in sporting goods, in high pressure valves and packings, in acid pumps and utensils, and scores of minor lines. In all of these lines substitutes have been produced—some with a considerable degree of success, due, as a rule, to the low price at which they could be marketed.

Hard rubber has so many valuable properties that it cannot be said that any substitute possesses all of them. A number have some of them, and in many cases these properties are sufficient for requirements for certain purposes.

The superiority of hard rubber for insulating purposes was early recognized. In addition to the higher cost of vulcanite, its deterioration when exposed to light has been mentioned as an argument against its use.

In the Bureau of Standards at Washington a sample was kept in diffused light for a year and a marked deterioration in its insulating capacity was noted on testing. On exposure to sunlight for about six months it had deteriorated more than in the previous year.

Various methods of cleaning the surface were tried. Rubbing with oil improved it, but not as much as desired. Caustic soda improved the appearance but not the insulating qualities.

Finally, it was found that by soaking in water for two days the resistance became greater than in the original sample, on account of the rougher surface. Unfortunately, this experimental sample contained a large amount of filler besides the rubber and sulphur. The nature of this filling material was not determined or disclosed. It is quite likely, therefore, as suggested in the record of tests, that soluble sulphates were formed on the surface from oxidation of the sulphur in combination with the filling.

INSULATING MATERIALS.

While insulating materials such as mica, porcelain and glass do not possess the toughness and elasticity of hard rubber, they are used as substitutes because of their cheapness.

Rubber is by far the best binder for any sort of molded insulation. Shellac, however, is extensively used, with fillers to give strength or to improve the fireproof qualities. Shellac has risen so in price that of late it has been displaced by cheaper gums, such as damar, rosin and the asphalts. These gums are melted, then put into a mixing machine with the fillers, taken out and rolled into sheets, which latter operation closely resembles ordinary rubber mixing. The sheets are cooled and broken up, softened and put into hot molds, pressed, cooled and emptied out as finished product. Another method is to dissolve the binding material in a solvent, mix with the filler, cool and then remove and dry. When the product becomes hard it is ground to powder. This is placed in heated dies and pressed till melted, then cooled in the die and removed in finished condition. There being no vulcanization, it is evident that only those binders can be used which are plastic when hot and solid when cold, and that if heated while in use to the fusing point the binders will soften and



Benton Rubber Mfg. Co.

CHEMICAL LABORATORY IN A BAKELITE PLANT

be worthless. A large percentage of fillers, however, will stand high heat for a short time. Ordinary asphalts, pitches or bitumens are not suitable for this work, as they soften at too low a temperature.

Rosin, while the cheapest gum, also melts at the lowest temperature and therefore is the most unsuitable. Rosin

hardened with lime, as used in varnish works, is better. In these compounds the higher the percentage of the binder the better the insulating qualities; of filler, the more fireproof the product. In using asphalts and binders of this class heat is not employed, but the binders are dissolved in solvents and mixed with the fillers to make a plastic which is cold-molded and afterwards dried to remove the solvent and thus harden the mass. These products do not resemble hard rubber as closely as those before mentioned, but they are largely used as insulators, and while liable to shrink in drying, yet they can be so made as to be acceptable for many classes of work.

CASEIN PLASTICS.

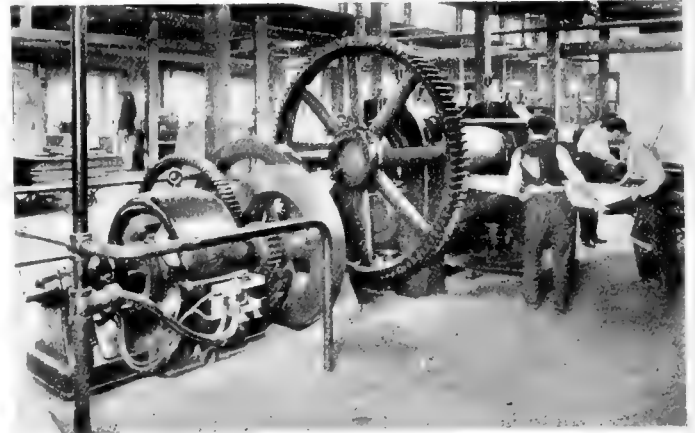
A great deal of work has been done and money spent in the endeavor to produce plastics having a basis of casein. It does not seem to be a promising material, yet many articles, such as billiard balls, have been made from it.

While casein can be obtained from skim-milk by use of rennet, as in manufacturing cheese, it is customary to use muriatic acid for coagulating when making it commercially.

Casein mixed with lime or other alkali and a little water can be molded into a plastic mass which dries very slowly to a transparent mass nearly as hard as bone and which can then be turned or otherwise worked. If mixed with fillers and slowly dried it shrinks some, but retains its shape. The great weakness of all these casein articles is their affinity for water. If they lose absolutely all their water they become hard and brittle and are no longer plastic. On the other hand, if subjected to moisture they are liable to absorb it and decay. To avoid this casein is treated with formaldehyde, which hardens it and renders it more insoluble. This product, patented, is in use under the name of galalith. Galalith has been introduced in the European market in a variety of forms and has been used quite largely. It is a hard, horny mass which, by the incorporation of pigments and fillers, can be converted into imitation ivory, jet, horn, etc., and into most articles ordinarily made from celluloid. Galalith is un-

If cellulose is treated with nitric acid, and preferably also sulphuric acid, under certain conditions of time, temperature and concentration, there results a nitrocellulose which, when mixed with camphor, produces the plastic ordinarily called celluloid, a substance which, though quite inflammable, is not explosive and is largely used for many purposes for which hard rubber is also well adapted. In American production the wet nitrocellulose is ground up with camphor and the mixture dried and heated, when the camphor enters into solid solution with the nitrocellulose, forming a plastic which may be rolled into sheets and also may be molded, while warm and soft.

In the manufacture of celluloid there are a number of



Delaware Hard Fibre Co.

CALENDERING SHEETS OF HARD FIBRE.

processes analogous to those used in rubber manufacture. There is the mixing of the nitrocellulose and camphor on rolls while a little solvent, such as alcohol or ether, is added to keep the mass soft while the rolls are heated to about 50 degrees C. Cut sheet is also manufactured from celluloid in a manner very similar to rubber. The celluloid is also calendered to give a smooth finish to sheets. The hot molding is done in presses similar to vulcanizing presses.

Celluloid has one feature favoring it over rubber in that it is transparent and readily takes any color. Being so easily molded, it is used to imitate horn, ivory, tortoise shell, ebonite, etc.

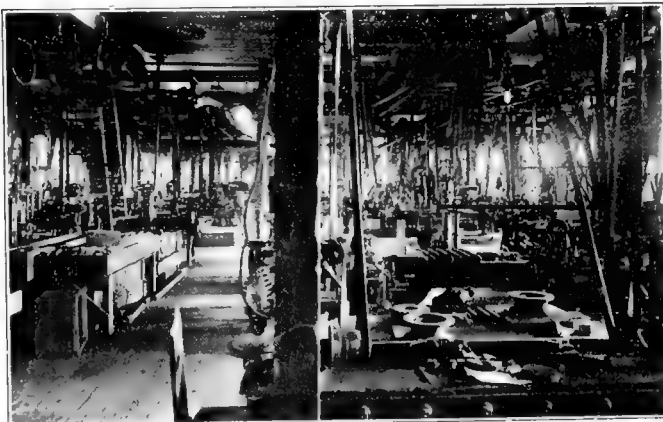
The mixture of casein with celluloid is said to have met with considerable success, particularly in reducing its inflammability.

CONDENSATION PRODUCTS.

If a phenol or carboic acid, or body of this nature, is heated with formaldehyde or a similar body, a condensation product is formed with elimination of water, the body first appearing as a heavy oil, then assuming a resinous appearance, all the time becoming harder and more insoluble; and finally, if highly heated, becoming very hard and insoluble, somewhat resembling amber in appearance.

While this general process was long known, it was not until Dr. Baekeland produced Bakelite that it became of commercial importance. His work resulted in two fundamental discoveries: First, he found that in the presence of minute quantities of alkali, preferably ammonia, the reaction became controllable and was greatly hastened, so that the formation of the resins of uniform compositions and properties became easy; and, secondly, that if this formation was treated in molds under heat and pressure, the hard insoluble variety free from porosity could be made successfully.

Before molding it is customary to mix in some kind of filler for most objects. Asbestos is a favorite for this purpose, and when used the product gives good insulation below 2,500



Imperial Vulcanized Fibre Co.

MACHINING OF VULCANIZED FIBRE PARTS.

affected by fats and oils, alcohols or dilute acids, but it swells up in alkaline liquids. It is as good an insulator as celluloid and will resist fire, as it chars without melting. It is free from the camphor smell of celluloid, and odorless.

CELLULOID

Celluloid is a plastic which closely resembles hard rubber in some of its valuable qualities. It is tough, flexible and elastic to a remarkable extent and can be molded with ease. As when heated it becomes soft. Its great drawback is inflammability.

Gun cotton, or the highly nitrated cellulose, was first made in Europe. Dissolved in ether, the solution was known as collodion and was used for photographic films at an early day.

volts, and at temperatures up to 400 degrees F. it remains uninjured. Wood flour is also used as a filler, in which case temperatures up to 250 degrees F. are safe.

While the product is quite strong, it is not flexible to any extent and in this respect is not like hard rubber. Having no sulphur in its composition, metals may be imbedded in it safely. It shares with rubber an indifference to acids and alkalies and chemicals generally. It is practically fireproof, in which it has a great advantage over celluloid.

VULCANIZED FIBER.

When cellulose is treated with metallic chlorides—generally zinc chloride—it is partially dissolved, softened and rendered adhesive. Usually sheets of paper thus treated are stuck together to form a thick sheet. This is vulcanized fiber. It is molded by pressure, is tough and somewhat elastic and can be worked with tools. It may be considered as a substitute for hard rubber in some respects. Its great weakness is its susceptibility to moisture, and it requires a coating of waterproof composition.

EXPLAINING THE EMBARGO GUARANTEES TO DEALERS.

IN order that the manufacturers of automobiles and dealers who purchase any part of their supplies from the manufacturers of rubber goods may have a perfectly clear understanding of the guarantees which the rubber manufacturers have been obliged to give the British Government in order to secure a supply of crude rubber, the Rubber Control Committee of The Rubber Club of America, Inc., has prepared a letter setting forth the conditions included under the guarantee in detail. The intention is to supply the manufacturers with this letter in sufficient quantities to distribute to all their customers. The letter will be printed on the letter-heads of the Rubber Club, and will be furnished at the least possible cost. A copy of this letter—which is given in full below—was mailed by the club's secretary to all the manufacturers of the country on May 4. It is as follows:

IMPORTANT—CAREFUL ATTENTION REQUESTED THE BRITISH RUBBER EMBARGO.

To Dealers in Automobiles, Automobile Supplies and Rubber Goods:

In order that the situation in which American tire and rubber goods manufacturers find themselves on account of Great Britain's embargo on crude rubber may be as widely known as possible, it has been thought best that full details should be given to all handlers of tires and rubber goods, in the hope that they would extend the fullest co-operation to the rubber manufacturers in carrying out both the letter and the spirit of the guarantees the latter have given to the British government.

During the past few years American rubber manufacturers have been obtaining their supplies of crude rubber in increasing measure from the Federated Malay States and Ceylon, both of which are British possessions, until at the present time over 50 per cent. of the raw material comes from these colonies.

On November 12, 1914, the British Government placed an absolute embargo on all exportations of crude rubber from the British Empire, and as a result this source of supply was completely shut off from rubber manufacturers in the United States until the following January when the British Government decided to allow rubber to come forward under certain conditions.

The modifications of the absolute embargo were brought about through the united efforts of The Rubber Club of America, Inc., and the Rubber Trade Association of London, whose joint committee appeared before the British Government and made the necessary arrangements.

In this connection it is to be noted that the United States Government was unable to give assistance to the rubber manufacturers in this country. It was found to be purely a question as between the American rubber manufacturers and the British Government. Regardless of the feelings of Americans in the matter, it was simply a case of purchasing rubber from the country producing it on the terms laid down by that country, or on the other hand being entirely cut off from that most important source of supply.

After nearly two months' negotiations, the British Government formulated the following rubber guarantee, which has been signed by all of the leading rubber manufacturers in the United States.

RUBBER GUARANTEE.

In consideration of your consenting to the delivery to us of crude rubber, we, hereby give you the following undertaking, which shall remain in force so long as Great Britain is at war with any European Power:

We will not export from the United States any raw rubber, reclaimed rubber, or waste rubber, whether the same has been imported from the British Dominions or not, otherwise than to the United Kingdom or to a British Possession.

We will not sell the rubber now delivered by you to any dealer or other person or persons in the United States, but will use it for our own manufacturing purposes.

All orders received by us for manufactured or partly manufactured rubber goods to be sent to neutral European countries shall be executed from stocks maintained by us in the United Kingdom or be executed by shipments to the United Kingdom and reshipment from there under license to be obtained for export therefrom.

We will not execute any orders for manufactured or partly manufactured rubber goods to be sent either directly or indirectly to any country or State at war with Great Britain.

We will not sell any manufactured or partly manufactured rubber goods to any person in the United States without satisfying ourselves that there is no intention on his part to export or resell the same for exportation to any countries in Europe other than Great Britain, France, or Russia, otherwise than by shipping to the United Kingdom and reshipping from there, under license to be obtained for export therefrom.

If we export any manufactured or partly manufactured rubber goods to a destination outside Europe not being in a British Possession, we will, prior to or simultaneously with the shipment, give you particulars of the goods so shipped and their destination.

All rubber tires exported by us or sold by us for export shall bear a distinctive name or mark, which we will communicate to you, so as to identify them as being our manufacture.

These are the conditions under which practically all manufacturers of tires and rubber goods are operating today. Any serious deviation from these terms of sale would possibly mean that the absolute embargo on rubber might again be placed in force, in which case it would doubtless be much more difficult to persuade Great Britain to accept the guarantees of American manufacturers. Such action would result in about 250,000 people directly and indirectly employed in the rubber industry being thrown out of employment, besides inflicting great hardship on all consumers of tires and rubber goods.

The rubber manufacturers of the United States, therefore, through their trade organization, wish to communicate these facts to you and ask for your co-operation in fulfilling the terms of the guarantees they have given to Great Britain.

You will observe that all rubber manufacturers must satisfy themselves that there is no intention on the part of their customers to export or resell tires or rubber goods for exportation to any countries in Europe, other than Great Britain, France and Russia, otherwise than by shipping to the United Kingdom and reshipping from there under license to be obtained for export therefrom. This is the paragraph that all handlers of tires and rubber goods should fix in their memory and be careful to observe, as it is being found that Great Britain is most desirous of preventing direct shipments from the United States to neutral European countries. All such shipments must be made by way of some port in the United Kingdom.

Yours very truly,

H. S. VORHIS, Secretary.

May 4, 1915.

In the cargo of the "Lusitania," of the Cunard Line, destroyed by submarine on May 7, there was only a small quantity of rubber—\$341 worth of rubber scrap, \$131 of manufactured rubber goods and \$347 of reclaimed rubber; making a total of \$819.

IMPORTANT RUBBER CLUB COMMUNICATIONS.

DURING the past month, The Rubber Club of America, Inc., has sent out a number of important communications to its members and to others in the trade. One of these circular letters explaining the Embargo guarantees to all rubber dealers and especially to automobile and accessory dealers, will be found in another column. In addition, three other communications have been issued by the Club, one referring to importations of unsold rubber and incorporating a letter on the subject from Sir Richard F. Crawford, another requesting the firm members of the Club to give their opinion regarding Government assistance to the merchant marine and the third and most important of them all, referring to the arrangement made by the Control Committee of the Rubber Club for warehousing unsold portions of rubber arriving in New York, together with an agreement which the importer must sign in order to have such rubber held in the warehouse, subject to his order. These documents are as follows:

April 30, 1915.

IMPORTATIONS OF UNSOLD RUBBER

To Crude Rubber Importers, Dealers and Brokers:

The following letter on the subject of unsold rubber has been received from Sir Richard Crawford, who is representing the British Government in this country in respect to the rubber embargo, and it is hoped the trade will take careful note of its contents:

British Embassy, Washington.

April 16, 1915.

Mr. C. T. Wilson, Chairman, Rubber Control Committee, Rubber Club of America, Inc., 17 Battery Place, New York.

Dear Sir: I am to acquaint you that the importation from London under export licenses of large quantities of unsold rubber is entirely contrary to the spirit of the agreement. The British authorities dealing with this question would be glad of your cooperation in discouraging the accumulation of unsold stocks of raw rubber, and we should be glad to consider any suggestion you can offer which will enable the Committee to ensure that speculative permits are not passed.

Yours very truly,

(Signed) R. F. CRAWFORD

The above is submitted for your information.

Very truly yours, H. S. VORHIS, Secretary.

May 18, 1915.

REFERENDUM ON THE UPBUILDING OF THE UNITED STATES MERCHANT MARINE

To the Firm Members of The Rubber Club of America, Inc.:

The Chamber of Commerce of the U. S. A. is canvassing the business communities of the country to ascertain opinions on the question of the upbuilding of the United States Merchant Marine. It is most necessary that crystallized business opinion in regard to the principles governing the future policy of the United States toward its Merchant Marine should find adequate expression at this time. When Congress meets there will undoubtedly be proposals for new legislation.

You are accordingly asked to register your opinion "in favor of" or "opposed to" the four questions which appear on the accompanying sheet.

As the ballot of The Rubber Club of America, Inc., representing the rubber industry, must be cast by June 22, 1915, in order to be counted, we would ask you to indicate your opinions on the accompanying questions at your earliest convenience.

Very truly yours, H. S. VORHIS, Secretary.

The four questions referred to in the communication quoted above, together with the vote which up to the end of May had been cast by the firm members, are as follows: Question 1, referred to the purchase and operation of merchant vessels by the Government. The vote was 33 in favor and 82 against. The second question covered Government ownership of merchant vessels, but with operation by private parties under leases. The vote was 33 for and 83 against. The third question referred to Government subsidies, sufficient to enable American ships to compete with foreign ships. The vote was 89 in favor and 25 in opposition. The fourth question covered Government subventions for the purpose of establishing mail and freight lines under the American flag to countries of commercial importance to the United States. The vote showed 106 in favor and 41 opposed.

THE WAREHOUSING OF UNSOLD PORTIONS OF RUBBER IMPORTATIONS.

The following communication states that arrangements have been made by the Rubber Club for the warehousing of unsold lots of rubber and includes a copy of the agreement which the importer wishing rubber to be stored for his account must sign:

May 25, 1915.

To Crude Rubber Importers, Brokers and Dealers:

Arrangements having been completed with the British Consul General at New York whereby unsold portions of rubber arriving here may be put into store, we beg to enclose copy of agreement which any importer wishing rubber to be stored must sign, and which must be filed with The Rubber Club of America, Inc., in conjunction with the manufacturers' guarantees for the said rubber.

It must be clearly understood that this privilege is granted by the British Government solely for the purpose of assisting the importer who may have, at times, unsold portions of rubber arriving, but not for the accumulation of stock.

The Rubber Club of America, Inc., will make a charge, to be paid by the importer, of 25c. per case on rubber placed in store, which will be in addition to the 6c. per case paid by the manufacturer for the certification and recording of guarantees.

Very truly yours, H. S. VORHIS, Secretary.

AGREEMENT.

To The Rubber Club of America, Inc.:

Acting in our behalf and in order to meet the conditions and requirements of the British Consul General at New York as concerns the storing of rubber in public warehouses, by which arrangement he will permit parcels of rubber consigned to his order to be warehoused, we understand that prior to his endorsement to you of the bill of lading for purposes of clearing you must file with the Consul General an undertaking in form and substance as follows:

The undersigned, as agents for His Britannic Majesty's Consul General at New York, accepts the custody for the purpose of putting in store in his behalf the following rubber:

Number of cases
 Marks
 Quantity
 Grade
 Importer for whose account it is to be stored.....

In consideration of the granting of this trust by H. B. M. Consul General at New York, The Rubber Club of America, Inc., will hold itself responsible for the delivery to the Consul General, as expeditiously as circumstances will permit, of a non-negotiable warehouse receipt made out to the order of the British Consul General at New York calling for aforesaid rubber.

We hereby undertake not to deliver the rubber above described, or any part of it, to any person or persons, or otherwise to dispose of the same without the written consent of the British Consul General at New York, during the period elapsing between the endorsement of the bill of lading to us by the Consul General and the delivery by us of the aforesaid warehouse receipt.

The Consul General will release any or all of the rubber so stored at the request of the owner upon the filing with him in the usual way of guarantees to his satisfaction.

THE RUBBER CLUB OF AMERICA, INC.,

By
 Secretary and Treasurer.

We hereby agree that as long as you act in our behalf in this manner that we will save you harmless from any loss that we may sustain by reason of any acts committed by you or your agents in handling rubber for us in this way.

We further hereby agree to pay any and all public storage charges that you may incur in making Custom House entries and any and all weighing, trucking and warehouse charges and other expenses that may be incurred in the premises.

New York,

1915

New Machines and Appliances.

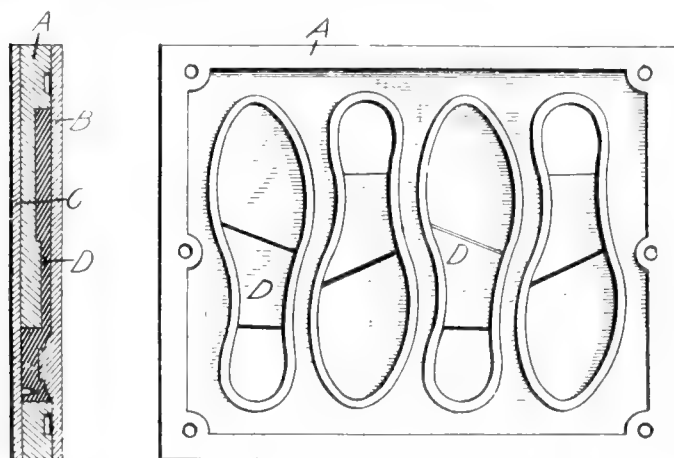
THE most important patents recently granted are illustrated and described in the following pages. Selection has been made of representative machines which show improvement in that particular branch of the trade to which they belong.

As an example, Landin's machine that covers rolls of friction tape with tin-foil is both novel and ingenious. The mechanical defects of single molds have been overcome and production increased by Hill's unit gang mold for rubber soles. Seamless tubing is made on an ordinary tubing machine with a special head so that soapstone can be applied to the interior of the tube without dust escaping to annoy the operatives. There is a British machine, by Bertram's, Limited, that makes mosaic carpet of various designs and colors in continuous lengths, and Bridge has patented a new cooling roll for mixers. A dipping and drying machine for making gloves, etc., has improvements that are recognized at once by manufacturers of druggists' sundries. Two separate patents provide for treating inner sole fabric and a new apron mechanism for mixing mills has been invented by Welton.

These and other devices are briefly described in the following paragraphs.

RUBBER SOLE GANG MOLD.

THIS invention provides strong molds that do not break easily and with interchangeable parts on which uniform pressure may be maintained, for producing a variety of soles. The plan view on the right shows the middle section of the mold *A* with the top and bottom plates *B* and *C*

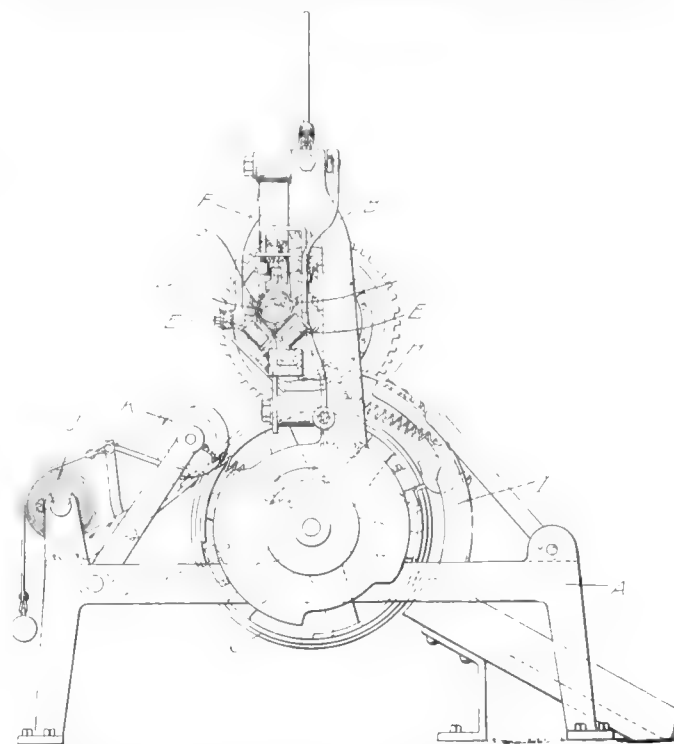


removed, while on the left is a vertical section showing the plates in position. In the arrangement of the four single molds *D*, shown in the drawing on the right, the toe of one mold is adjacent to the heel of the next, which gives greater strength to the heel portions of the forms. The molds are uniform in thickness with the middle mold, thereby preventing uneven pressure on the contour frames. [Charles H. Hill, United States patent, No. 1,136,336.]

MACHINE FOR COVERING ROLLS OF FRICTION TAPE.

The operation of the machine is as follows. A series of uncovered tape rolls is placed in the roll carrier, resting upon the upper laps of the endless feed bands. The tin-foil is passed under the feed roll and laid upon the periphery of the bed roll. This is set in rotation and the uncovered tape rolls are fed one by one to the holding jaws or arms that deliver them to a chute with guides which present the rolls in proper position above the bed roll. The tape roll is then pressed down on the

cut portion of strip of tin-foil on the bed roll, and is revolved, winding the strip of tin-foil thereon in the form of a

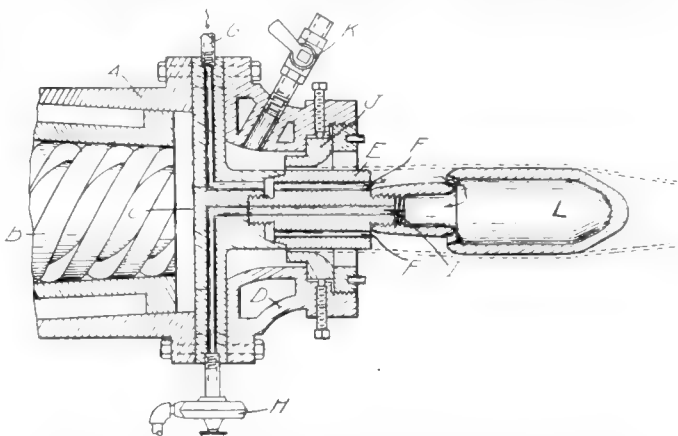


A Side Frames *B* Upright Frames *C* Bed Roll *D* Rolls of Uncovered Tape *E* Roll Carrier *F* Roll Feed Lever *G* Roll Grips *H* Roll Presser *I* Feeding Device *J* Roll of Tin-foil *K* Tin-foil Feed Roll.

cylinder having ends which project beyond the sides of the tape roll. A folding device folds these projecting ends against the sides of the tape roll, as it is carried through the passage from which it drops into the delivery chute. [C. J. Landin, assignor to Boston Woven Hose & Rubber Co., United States patent, No. 1,134,208.]

BLEECKER'S IMPROVED TUBING MACHINE.

The object of this invention is to make seamless rubber tubes in continuous lengths and at the same time apply soapstone to



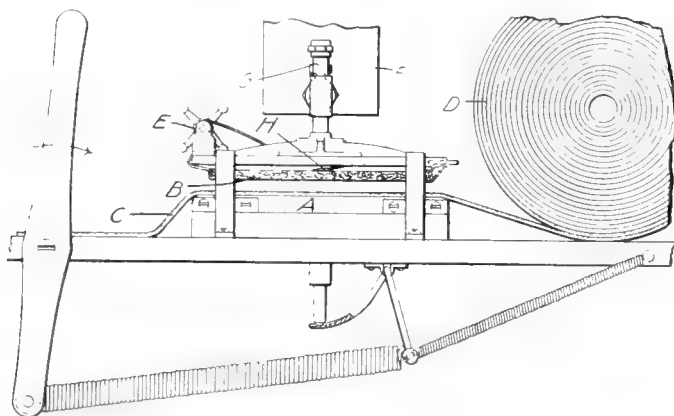
A Cylinder *B* Stock Worm *C* Gro. Hopper *D* Head Section *E* Compound Gro. *F* Soapstone Head *G* Soapstone Supply Pipe *H* Air Pump *I* Soapstone Outlet *J* Rock Drive *K* Relief Valve *L* Gro. Lining.

the interior. The illustration shows in section the head and part of the stock worm and cylinder. The compound is forced

by the stock screw into the lead section, and then through the space between the ring die and the cylindrical core. The outer diameter and the thickness of the tube are determined by the die, while the inner diameter is determined by the core. The suction pump continuously draws the soapstone through the supply pipe and the outer inlets in the core to the interior of the tube, where it acts as a lubricant. From here it passes into the hollow core extension, and is returned to the source of supply through the outlet in the center of the cylindrical core. [A. Bleeker, assignor to the Portage Rubber Co., United States patent, No. 1,133,610.]

MACHINE FOR TREATING INNER SOLE FABRICS.

The machine in the illustration is for softening or rendering adhesive the coated surface of proofed fabric such as is used for making inner soles. Fabric coated with rubber has a tendency to curl, and it is, of course, difficult to apply the solvent evenly over the coated surface unless it is perfectly flat. For this reason this device is provided with a movable bed plate and a stationary solution pad of absorbent material. The fabric is fed between these two members, and the pressure applied by the bed plate smooths out the fabric while the solution is uniformly applied to the coated surface. [B. F. Chamberlin, Jr.,



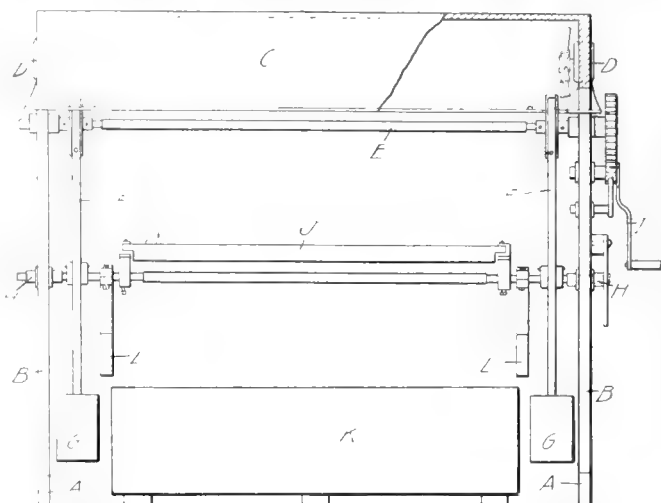
A—Bed Plate. B—Felt Solution Pad. C—Proofed Fabric. D—Fabric Roll. I—Solution Pad Adjustment. I—Solution Tank. G—Solution Valve. H—Valve Lift.

and J. N. Moulton, assignors to Massachusetts Chemical Co., United States patent, No. 1,131,993.]

RICHERT'S DIPPING AND DRYING MACHINE.

This invention provides a machine for making such rubber articles as are produced by repeatedly dipping forms in rubber solution and allowing the coating to dry between the successive dippings. The two side frames mounted on base plates support the bearings of the driving and dipping shafts and also

an air circulation. The dipping frame supporting a large number of forms is lowered by lifting belts operated by a hand



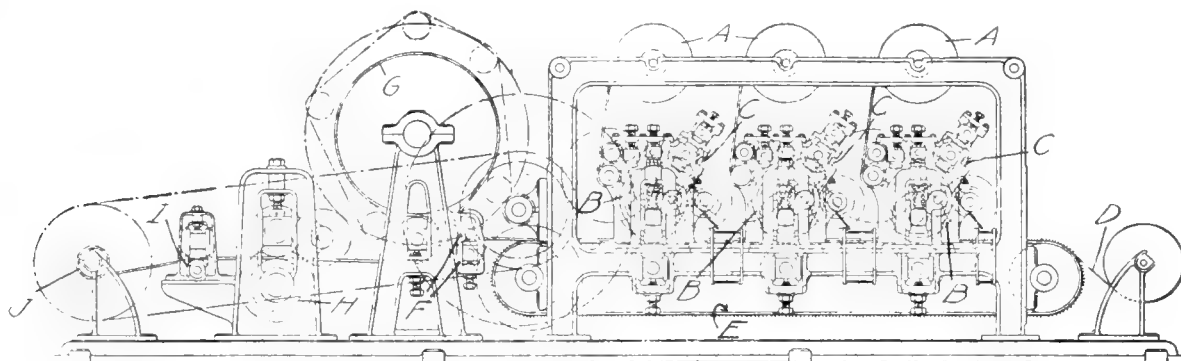
A—Base Plates. B—Side Frames. C—Fan Box. D—Fan Blowers. I—Main Shaft. E—Lifting Belts. G—Counterweights. H—Dipping Frame Shaft. J—Power Crank. K—Solution Tank. L—Dipping Frame Counterweights.

crank and is raised in the drying position by counterweights. [E. T. Richtert, assignor to the Reality Rubber Co., United States patent, No. 1,133,820.]

MACHINE FOR MAKING RUBBER MOSAIC CARPET.

Rubber flooring is usually constructed of interlocking tiles of various colors and shapes, which are carefully laid and cemented together. Rubber carpet is also made with hand-stamped patterns, inlaid with colored rubber shapes of various designs. Now we have a machine that cuts out small cubes or squares from different sheets of white or colored rubber, assembles them together and forms a continuous length of mosaic carpet, which is wound in a roll ready to be vulcanized.

The rolls of colored stock A are supported by the side frames, and the sheets are simultaneously fed over the revolving cutting drums B. The peripheries of these drums are fitted with adjustable knives that are arranged to cut the cubes from the sheets as they pass between the drums and the presser rollers C. As the drums revolve, the cut cubes are delivered on a backing cloth D, and are held in alignment by the sharp points of an endless belt of card cloth E, penetrating through the backing cloth. The cubes and cloth then pass between the calender rolls F, and around a heated drum G, which softens the solution on the cloth and causes the cubes to adhere to it. After passing between the final calender rolls H, where the pattern is consolidated, and the edge trimming knives I, the mosaic carpet is



the drive gearing. Extending across the top of the machine is a fan box with electric fan blowers at each end for creating

wound up on the roller J, and is then vulcanized. [Bertrams, Limited, and R. F. Gillespie, British patent, No. 9,195.]

OTHER DEVICES.

INDICATING GAGE FOR INSULATED WIRE.—In the covering of insulated wire the rubber coating is sometimes applied in an irregular manner or it varies considerably in thickness. It is difficult to detect these variations, which usually occur gradually, resulting in several feet of imperfect product before the defect is discovered. The indicating gage will prevent such occurrences. When wire that varies in size passes between the standard gage rollers a sensitive pointer vibrates over a graduated scale, attracting the attention of the operator. [W. H. McGauley, United States patent, No. 1,133,300.]

COBB'S BRAIDING MACHINE.—His latest invention relates to machines for braiding tubular fabrics, and can be applied to any ordinary braiding machine. There is a supplemental mechanism or attachment whereby any desired number of warp yarns are introduced into the fabric. For this purpose there are as many shuttles as there are yarns to be introduced. These shuttles, located under the shed of interbraiding yarns, are projected upward through the shed by shuttle-throwing devices of novel construction. Each shuttle travels in a vertically extended raceway made in two sections with a gap between for the passage of the shed of braiding yarns. For controlling the shed it is confined between two rings located respectively above and beneath the shed, the space between forming the gap in which the braiding yarns travel. The approaching surfaces of these rings are preferably made sinuous, these edges drawing closer together in the paths of the shuttles and diverging between such paths. [H. Z. Cobb, United States patent, No. 1,133,364.]

DOUBLING AND CEMENTING FABRICS.—A machine has recently been patented by which materials such as leather, imitation leather, mohair and the like are cemented to a backing of cotton cloth. It has two rotary heated rolls and means for guiding two sheets of fabric from opposite sides over and between the rolls. A heated doctor applies the waterproof cement evenly to the surface of the covering fabric, which is then united to the backing fabric by passing between the heated rolls. [A. Leisel, United States patent, No. 1,133,440.]

APRON FEED FOR MIXING MILLS.—The object of this device is to return the material between the mixing rolls so that the mixing operation will be continuous. It also provides for throwing the apron out of gear or removing it entirely from contact with the front roll. The partially mixed rubber and compound passes down between the mixing rolls and falls on the apron, which carries it around the first roll as far as the apron is in contact with it. The compound adheres to the first roll, and is carried downward and between the two rolls, making a continuous operation. When the batching is complete the apron is dropped down out of the way and the compounded stock removed. [P. E. Welton, United States patent, No. 1,134,172.]

In a recent patent Welton covers several improved apron controlling devices and assembles the entire mechanism in a portable pan. The advantage in this is that the pan can be quickly adjusted under any machine, thereby converting it into a self-feeding mill. [P. E. and H. A. Welton, United States patent, No. 1,134,173.]

CEMENTING MACHINE.—In the manufacture of boots and shoes it is customary to skive the margin of certain parts of the upper and to apply cement to the skived margin, which is then folded. The cement must be applied evenly and quickly, which is the object of this invention. There is the usual cement tank, valve and cement-applying roller, driven by a belt, conveniently arranged above the machine table. Below this table a presser roll projects through an opening in line with the cement roller, which can be adjusted to the angle of the skive and presses the skived upper firmly against the cement applying roller. [John B. Hadaway, assignor to United Shoe Machinery Co., United States patent, No. 1,134,262.]

ARMORED HOSE.—Two half round wires are wound spirally around the hose one with its flat surface and the other with its round surface in contact with the hose. [H. W. Goodall, United States patent, No. 1,136,329.]

INNER SOLE MACHINE. The fabric is mechanically softened and longitudinal creases formed in it. Then it is made sticky by heat for application to the ribbed surfaces of innersoles. [James Meade, assignor to Plymouth Rubber Co., United States patent, No. 1,137,511.]

VULCANIZING FOOTWEAR.—A drum that supports six stick carriers upon which are fixed the lasted rubber shoes, revolves in a vulcanizing chamber. This machine will be described in detail in the July number of THE INDIA RUBBER WORLD. [T. H. Rieder, assignor to Canadian Consolidated Rubber Co., Limited, United States patent, No. 1,138,791.]

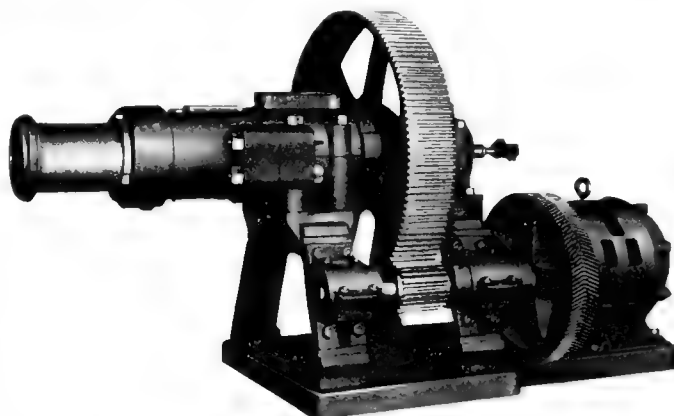
MASTICATOR ROLLS.—These are screw-like or spiral rotating blades, with convex surfaces that press the material directly towards the walls of the surrounding trough. This produces, with the rotary movement, a kneading action that effectively and rapidly works the mass into the required condition. [J. E. Pointon, British patent, No. 4,105.]

ROLL COOLING DEVICE. A recent English invention relates to that class of rubber machinery in which cooling and sometimes heating—the roll is necessary. The interior of the roll is divided longitudinally by a number of ribs, and is bored for a tightly fitting tube. The latter forms long chambers of the spaces between the ribs, and is also the central supply tube for the heating or cooling medium. The longitudinal chambers are connected with openings at each end so that water or steam circulates freely through the system. Thus the whole surface of the roll is cooled or heated as desired. [J. H. Nuttall and D. Bridge, British patent, No. 1,102.]

In comparing the above invention with the various American types, the similarity to Bragg's built-up roll and Brewster's and Norris' cooling rolls is noted. The longitudinal and connected chambers located near the roll surface and the central supply passage for the water or steam circulation are used in the Norris roll. Both Bragg and Brewster use a modified form of the same idea.

ADAMSON STRAINING AND REFINING MACHINE.

The new 8-inch reclaiming machine shown in the illustration is designed for large capacity and heavy duty. It is bolted to a continuous bed plate that supports at one end a motor and cut double helical reducing gear. The body of the machine is chambered for



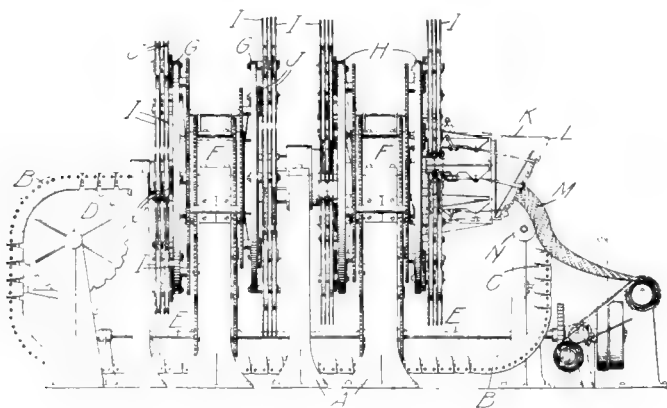
steam or cold water and is supported by heavy side frames bolted to the base plate. Journaled to the frames is the main driving shaft that drives the hollow steel stock worm through powerful cut spur gearing. The steel strainer head has unusual area, and an end plate with an efficient arrangement for holding the wire cloth. [The Adamson Machine Co., Akron, Ohio.]

New Tire Machines.

RECENT inventions pertaining to rubber tire manufacture have been both numerous and interesting. The following machines are evidence that unusual inventive skill is being consistently directed along the lines of increased efficiency. For instance, the Subers machine improves on the cord laying idea by automatically turning out tire castings in continuous lengths. Another interesting tire building machine performs a variety of operations that formerly were thought to be necessarily manual. The Thropp-de Laski tire-building machine was invented and is being built by practical rubber machinists. Tire bead cores are made from the roll of frictioned fabric by Stevens' latest machine. Gommeter makes the core first in a tuber, then covers it and forms the finished bead, while Thropp provides a ring template for centering the finished bead on the casing. Non-skid pneumatic treads are now made in molds and cured in the press with one operation, according to Sloper's British patent, while Finlayson's United States patent provides a mold for the same purpose. There are many other inventions of interest relating to tire manufacture, such as a tension device, impregnating machine, solid tire machine, several collapsible cores, etc., descriptions of which follow.

SUBERS' TIRE CASING MACHINE.

THE patents granted recently to Lawrence A. Subers relate to annular and tubular tire fabrics previously impregnated with rubber solution and made on an endless mandrel, which corresponds in cross-section with the finished casing. Later patents provide for a ribbon of metal inserted in a tubular

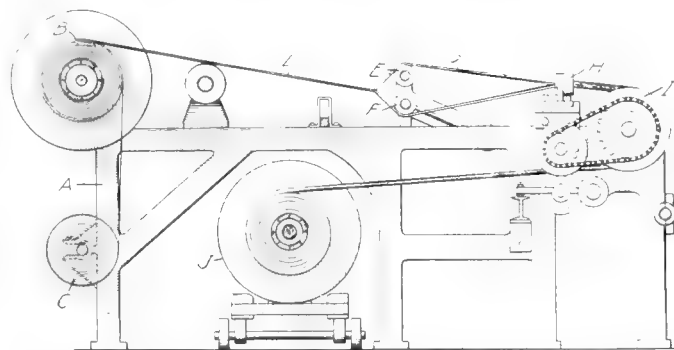


band, saturated with rubber solution, and made, on a special machine, into a tubular or sheet fabric of single thickness with raw edges, or one of double thickness with selvage edges, for hose, tires or belting.

The illustration refers to one of the former patents covering a machine for making annular tubular fabric on a curved mandrel. The three standards *A* support the frame of the machine and an endless mandrel *B* that travels on a T rail *C* driven by sprocket wheel *D* from the main shaft *E*. The bearings *F* support the four reels *G* and *H* and the spools *I*, on which the adhesive fabric bands are wound alternately, with non-adhesive strips from the spools *J*. The fabric bands *K* mounted on the revolving reels are guided to the right hand side of the machine, where rollers *L* guide the strips over the slowly moving mandrel forming the tube *M*, which is slit on its inner surface by the circular knife *N*. [L. A. Subers, United States patent, No. 1,132,635.]

STEVENS' BEAD FABRIC TEARING DEVICE.

The preliminary tearing device is not shown here, as this is mounted on a frame in line with and on the right of the machine illustrated, which is the final tearing device. The preliminary device consists of clamps that firmly grip the front



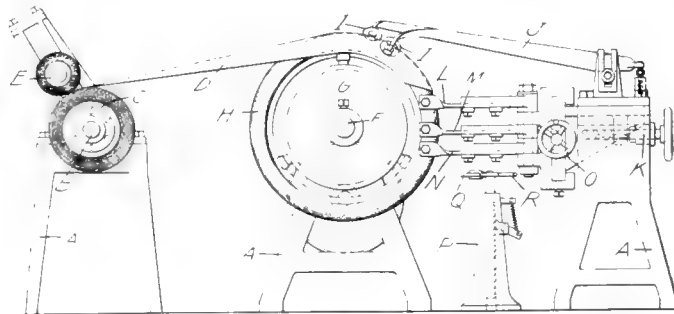
A—Side Frames, *B*—Fabric Roll, *C*—Liner Roll, *D*—Frictioned Fabric, *E*—Upper Tearing Roller, *F*—Lower Tearing Roller, *G*—Torn Strips, *H*—Forming Die, *I*—Bead Forming Sheave, *J*—Bead Spools.

edge of the cloth and are as wide as the strips into which the frictioned fabric is to be torn. The alternate clamps hold the fabric stationary, while the intermediate clamps are fixed to a movable bar which accomplishes the preliminary tearing when moved backward by the operator. The lever carrying the upper and lower tearing rollers is then swung in place, as will be seen in the illustration. The torn strips are released from the alternate clamps and passed around the lower tearing roller, while those from the intermediate clamps are passed over the upper tearing roller and are then united in sufficient number to form beads. When the machine is started the tearing action is continuous, and the beads are passed through the forming dies and the bead forming sheaves to the spools. [W. C. Stevens, assignor to the Firestone Tire & Rubber Co., United States patent, No. 1,134,293.]

PNEUMATIC TIRE MAKING MACHINE.

Cincher and quick detachable tire casings are made on this machine, which winds the fabric, applies the beads and practically finishes the casing mechanically instead of by hand, as is at present customary.

In making a tire the fabric strip is led from the supply roll and its end applied to the surface of the core. This is then



A—Side Frames, *B*—Fabric Roll Shaft, *C*—Fabric Roll, *D*—Frictioned Fabric, *E*—Liner Roll, *F*—Core Shaft, *G*—Chuck, *H*—Tire Core, *I*—Presser Rollers, *J*—Presser Lever, *K*—Lever Adjustment, *L*—Bead Applying Device, *M*—Bead Forming Device, *N*—Trimming Device, *O*—Saddle Adjustment, *P*—Vertical Stands, *Q*—Eccentric Rollers, *R*—Roller Hand Lever.

rotated and spacers are applied by hand to the fabric strip, pressing it closely against the under side of the core.

In some cases the tension on the fabric strip is relied upon, while in others presser rollers are employed to press the fabric

more firmly against the core. These rollers are mounted upon a forked lever and can be adjusted as the diameter of the casing increases, so that the same pressure is exerted upon the casing at all times. The rollers are placed obliquely, and one of them is located slightly in the rear of the other, the track of which it overlaps, so that the entire upper surface of the casing is subjected to the pressure of these rollers. For regulating the tension upon the fabric strip a friction bearing box is employed, which may be set to any desired degree of tension by means of screws.

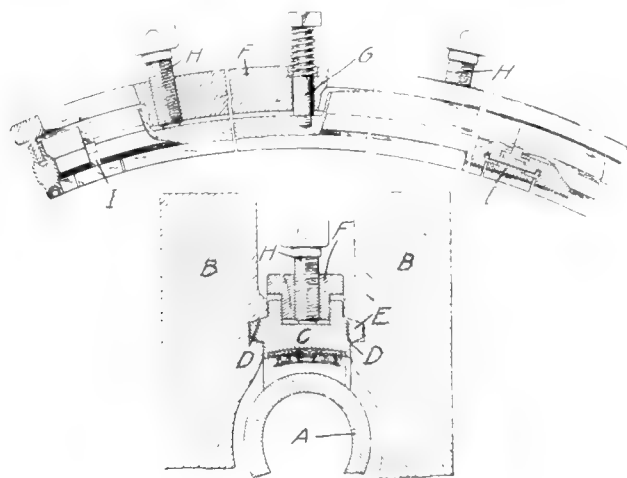
After a sufficient number of layers of the fabric (usually two) have been wound on the core, the customary beads are applied. If endless bead rings are used they are placed upon the peripheries of forms which are pressed against the partly formed casing. If a continuous bead stock is used the bead rollers are moved close up against the casing and guide the bead stock in place. When the bead is complete the stock is cut at the proper point so that the end will abut against the initial end of the bead.

After the beads have been attached, further layers of fabric are wound on the casing until sufficient thickness of fabric has been applied. To perfect the form of the casing at and around the beads forming rolls are employed. A padding layer of rubber stock is then rolled over the layers of fabric by the presser rolls, and a tread strip is applied. The casing is then finished and ready for curing. [T. J. Whalen, United States patent, No. 1,131,760]

NON-SKID TREAD MOLD.

This device consists of the ordinary core and a two-part mold that forms the sides of the tire casing. The non-skid tread is formed by ring segments that are held between the upper and lower molds and are pressed against the rubber by bolts carried in a thrust ring.

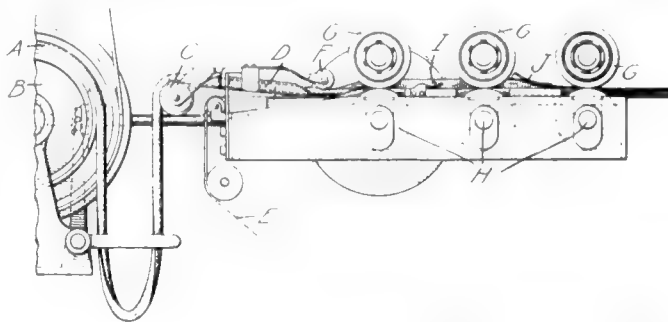
Referring to the drawings below, *A* is the core and *B B* the upper and lower mold parts. The tread forming ring *C* is composed of segments and has ribs *E* that align with the grooves *D* of the mold parts *B B*. Referring to the upper drawing, the tread forming segments are adjustably attached at their centers to the ring *F* by spring bolts *G*. The annular thrust ring *I* is drilled and tapped to accommodate the bolts *H*, which bear on the ends of each tread forming segment. The recesses formed in the ends of the segments are filled by the T-pieces *J*, which prevent the rubber from spewing. The core with the tire casing is placed in the lower half of the mold and the upper half is placed upon it with the tread segments be-



tween them. These are advanced by the bolts, compressing the rubber and forming the non-skid tread. The mold parts are then clamped together, which registers the tread sections. [Thomas Sloper, British patent, No. 2,498.]

TIRE BEAD FORMING AND COVERING APPARATUS.

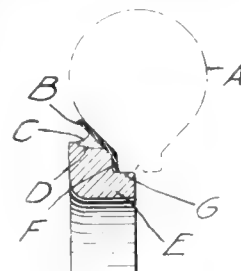
The complete apparatus consists of a tubing machine for extruding a bead core of desired section, and an endless belt for conveying it from the tubing machine to the covering



mechanism, which is shown in the illustration. The core *A* is conveyed from the tubing machine by the endless belt, which passes around the pulley *B*. It is then delivered to the covering machine supported by guide roller *C* and advance guide *D*. The strip of frictioned fabric *E* passes over guide rollers and underneath the core, which is pressed against it by the roller *F*. As the core and fabric pass between the presser rollers *G* and the forming rollers *H*, the bead is formed and the fabric folded over it by the guides *I* and *J*. [John R. Gammeter, assignor to The B. F. Goodrich Co., United States patent, No. 1,137,127.]

BEAD ADJUSTING DEVICE.

In making a clincher tire it is very important that the beads should be located exactly in the right position. This is accomplished by Thropp's invention after the following method: The tire casing *B* is laid on the core *A* in the usual manner. The bead is then placed in position on the shallow curved recess *D* on the head adjusting ring *E*. The latter may then be moved laterally into position with respect to the core and the ring itself adjusted accurately in position by the entrance of the shoulder *G* within the inner wall of the core. When pressed laterally against the casing, the base of the bead will be brought into contact with it, causing the bead to adhere to the tire casing, which is formed of unvulcanized rubber. The bead adjusting ring may then be removed, leaving the bead in its proper position with respect to the core and the tire casing. [J. E. Thropp, United States patent, No. 1,131,173.]



OTHER DEVICES

MOLD FOR NON-SKID PNEUMATIC TIRES. This mold forms the non-skid tread and provides for the complete curing of the tire within the mold in a single operation. The casing, built up on the core, as usual, is placed in the mold, which is then closed. The tread mold made up of four sections is forced by a rotating ring against the rubber, forming the non-skid tread. The mold is then placed in a heater under pressure, and the tire, when cured, is removed from the mold by rotating the ring in the opposite direction. [A. W. Finlayson, United States patent, No. 1,132,250.]

A FABRIC TENSION DEVICE. Two pressure rolls that revolve in bearings supported by two side frames are placed one above the other, and are adjustable vertically. Directly opposite these rollers is an idler roller journaled in the side frames. The fabric is passed around the lower roll and up between the pressure rolls, and then around the idler roller and back again between the pressure rolls. When the rolls are brought together friction is established between the fabric moving in one direction and

the same belt moving in the opposite direction, producing the desired tension. [E. Nall, assignor to the Goodyear Tire & Rubber Co., United States patent, No. 1,133,309.]

MACHINE FOR WINDING BOBBINS.—This is a machine for winding tape or fabric on bobbins, to be used in wrapping open cure tires. The strips are moistened, straightened, smoothed and wound with uniform tension. [A. de Laski, assignor to De Laski & Thropp Circular Woven Tire Co., United States patent No. 1,132,076.]

TIRE BEAD WRAPPING MACHINE.—The endless core of the bead is made up of five wire strands. This is placed in the machine, which stretches and wraps around it spirally two overlapped layers of frictioned tape, grooved rollers at the same time giving the bead its desired shape. [F. W. Kremer, United States patent, No. 1,132,359.]

COLLAPSIBLE CORE.—The four sections of this core are beveled on their inner lateral surfaces, and are held in perfect registry by a single annular ring and eight cap screws. [P. and B. de Mattia, United States patent, No. 1,135,774.]

MOLD FOR MAKING LEATHER TIRE CASINGS.—Leather casings for pneumatic tires are made by forming a strip of undried chrome leather in a U-shaped mold. The projecting edges are turned inward, covering the beads, which are cemented and pressed in place on the casing by movable dies. [G. W. Bell, United States patent, No. 1,132,904.]

IMPREGNATING AND COATING MACHINE.—To prevent the formation of air bubbles when proofing fabrics, cords and cables, the air is first exhausted from the material, which is then passed through the rubber solution before exposing it to the atmosphere. [L. P. Destribats, United States patent, No. 1,135,777.]

A similar patent granted to the same inventor was illustrated and described in THE INDIA RUBBER WORLD January 1, 1914.

COLLAPSIBLE CORE. Each of the four sections has a socket at one end and a projecting rib at the other. These engage and align the sections when they are brought together to form the core. On the inner surface of each section are slots that register with similar slots in the adjoining section. These receive the locking plates, which are held in position by taper pins when the core is assembled. To remove the core the taper pins are driven out and the locking plates removed; when the sections can be withdrawn from the finished casing. [George H. Naylor, United States patent, No. 1,133,445.]

THROPP-DE LASKI TIRE MAKING MACHINE.—The original application was filed January 24, 1912. It was divided and this application was filed September 19, 1913. The patent for the original application was granted December 1, 1914, and was illustrated and briefly described in THE INDIA RUBBER WORLD of January, 1915. The patent for the final application has just been granted. [J. E. Thropp, P. D. Thropp and A. de Laski, assignors to The de Laski & Thropp Circular Woven Tire Co., United States patent, No. 1,137,365.]

SOLID TIRE MACHINE.—This is a rolling machine with two power driven rolls. The upper roll is raised and lowered by worm and screw gearing, and can also be accurately adjusted so that it is parallel with the lower roll. In rolling the hard rubber foundation on the rim, the latter is hung on the lower roll and fastened in place by adjustable collars and set screws. The warmed up stock is fed to the machine by hand, and the lower roll is rotated, forcing the plastic material into the grooves, forming dove-tail ribs which secure the foundation to the rim. The foundation may be made of any required thickness within the capacity of the machine by raising or lowering the upper roll. [H. Henning, United States patent, No. 1,134,454.]

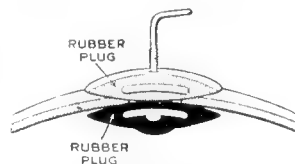
COLLAPSIBLE CORE.—This pneumatic tire core is formed of a plurality of sections fastened together by fixed and expanding

rings. [Guy E. Horton and Caspar S. Wagner, United States patent, No. 1,136,805.]

SHIELD FOR VULCANIZING MOLDS.—To prevent the formation of ridges on the inner surfaces of cord tire casings during vulcanization, a stiff flexible shield is placed between the pressure bag and the casing. [J. D. Tew, assignor to The B. F. Goodrich Co., United States patent, No. 1,137,097.]

AN INNER TUBE REPAIR PLUG.

The claim of the makers of the Sampson repair plug for inner tubes is that "it is totally unlike anything ever before devised," the intention presumably being to convey the idea that it is vastly superior to all other such devices. The inventor of this plug is



responsible also for the invention of the Sampson bicycle plug for roadside repairs on bicycle tires. This bicycle tire plug was made of metal, the new one differing in that it is composed largely of rubber. The plug consists of two

small metal discs covered with thick layers of rubber, as shown in the illustration. When a puncture occurs, the hole in the tire is stretched sufficiently to permit of the insertion of the under half of the plug, and the two discs are brought together by the wire thumb screw, which is then broken off. The pressure of the rubber sections against each other and against the edges of the tube is sufficient to ensure an effective and permanent cure. [Stevens & Co., 375 Broadway, New York.]

THE DAY SECTIONAL CASING.

This casing is really an outer non-skid tread for pneumatic tires, one that can be easily applied to either new or worn tires. It consists of separate sections or pads made from specially prepared rubber and fabric vulcanized under hydraulic pressure. Thirty-three of these sections—each of which is placed across the tread, with the ends pressed down against the side of the casing, as shown in the illustration—are required to cover the outer circumference of a standard tire. When all the sections are in place they are securely held together by steel rings, which grip the ends of the sections. Any number of sections can be added, to fit the tire, and new one can be obtained to replace others that have become worn. [Day Sectional Casing Co., Chicago.]



THE AUTO-PED.

This is a huge roller skate, driven by a diminutive gasoline motor built in the front wheel. This unique vehicle is provided with pneumatic tires and will carry an adult at a speed of about 25 miles per hour. Gasoline is supplied from a tank built around a steering rod, which can be folded down and used as a carrying handle. [The Auto-Ped Co., New York.]

HUGE TIRES FOR MOTOR TRUCKS.

Pneumatic tires measuring 38 x 7 inches, 42 x 9 inches, and 48 x 12 inches, are now being marketed for use on motor trucks ranging in capacity from 1½ to 5 tons. These tires are made especially for use on trucks carrying passengers or fragile merchandise, and it is claimed that their advantage over dual tires lies in the fact that in case of a puncture the driver is bound to notice it at once, whereas with dual tires he might allow one of the tires to support the whole weight for many miles. These are probably the largest tires on the market. [The Goodyear Tire & Rubber Co., Akron, Ohio.]

What the Rubber Chemists Are Doing.

RESEARCH IN RUBBER RECOVERY. F. Kirchhof, in the "Kolloid-Zeitschrift," vol. 15, pp. 126-131 (1914), recounts a series of experiments demonstrating the possibility of recovering rubber from its tetrabromide, basing his conclusions on Harries' octadiene formula for rubber.

VULCANIZATION ACCELERATORS. R. Ditmar, in "Gummi-Zeitung," vol. 29, pp. 424-426 (1915), discusses the efficiency of this class of materials, including the old-time reliable litharge, although no mention is made of lime. It is stated that positive materials have always been used to increase the speed and decrease the temperature of vulcanization; also, to overcome vulcanization retarders or negative materials, such as oil substitutes. Speed of vulcanization, up to a certain point, is proportional to the increase of amount of accelerator. Beyond this point, in some instances, the added substance acts negatively and retards. In general, accelerators must be used in small quantity, as otherwise the quality of the product is injuriously affected.

Acting together in a compound, accelerators produce an increase of speed greater than would be indicated by the sum of the individual reactions. Litharge accelerates because of the heat of reaction resulting between it and hydrogen sulphide, or, according to equally good authority, to the heat liberated in forming lead sulphate and lead sulphide from litharge and free sulphur in the compound. Magnesium oxide is almost as widely used as litharge. Iron oxide frequently helps in compounds containing brown substitute. Manganese and copper oxides should be avoided, owing to their deteriorating action on the rubber.

The use as accelerators has been patented, including piperidine and its homologues, certain amines, urea derivatives, carbon bisulphide addition products and all organic bases having relatively large amounts of dissociation constituents. The latter group act as accelerators irrespective of constitution. Organic and inorganic compounds of ammonia may also be used. For the complete list of available accelerators given by Ditmar, the original article should be consulted.

VAT DYES FOR COLORING RUBBER GOODS. R. Ditmar, in "Gummi-Zeitung," vol. 29, pp. 85-87 (1914), reports the successful use of organic coloring agents in the manufacture of colored rubber goods. Of a hundred different dyes tried, in white, soft and hard rubber mixes, about one-third of the dyes gave good colors, which withstood vulcanization. More delicate shades were obtained than with the ordinary inorganic colors.

ANALYTIC METHOD FOR SULPHUR IN RUBBER, reported by R. Gaunt, in "Analyst," vol. 40, pp. 9-10 (1915). The method of determining sulphur by burning in oxygen and absorbing the SO_2 has not been applied to rubber because of the formation of volatile decomposition products, which may escape combustion or form explosive mixtures with oxygen. The following method obviates this difficulty: The rubber (0.2 to 0.3 gram), contained in a small hard glass tube closed at one end, is placed in a combustion tube, 30-5 c.m. long, drawn out at the rear and fitted into a small flask, which is connected with another flask by a small tube. In each flask is placed 25 c.c. of 20 volume hydrogen peroxide. A loose plug of platinized asbestos is placed in the rear of the combustion tube, in front of the constriction. Dry oxygen is led through the tube, and the mouth of the inner tube containing the rubber is heated by a burner. The rubber is then gently heated by another burner until melting and decomposition begin. The gas evolved ignites at the mouth of the containing tube and burns with a smokeless flame, if care be taken. The gaseous products are usually destroyed in about 30 minutes, and the residual mass is then heated

more strongly until completely burned, any carbon deposits being burned away at the same time by moving the burner. The sulphuric acid formed in the peroxide solution may be titrated with a standard alkali, or by precipitation, after decomposing the excess of peroxide by boiling with hydrochloric acid. Blank determinations must be made on the peroxide. In the case of rubbers high in mineral matters, sulphates in the residual ash should be determined. The results reported closely agree with those obtained by the Carius method.

RUBBER FROM CRUDE OIL

It is reported that a Russian chemist has recently been able to secure from crude petroleum of the Baku oil fields a yield of 20 per cent. of adipic acid, the material being derived from certain fractions boiling between 208 and 223 degrees Fahrenheit. It is known that adipic acid is convertible, through its own amide, into butadiene. The discovery of an abundant supply of adipic acid is thus of great importance as a source from which to obtain synthetic rubber, since butadiene is simply converted into caoutchouc. California petroleum contains markedly similar fractions to those found in the oils from the Baku region, consequently there is a prospect of manufacturing rubber synthetically on the Pacific coast. In fact, the matter is said to be under experiment at present with that object in view.

PATENTED TREATMENT OF RUBBER

PRESERVING RUBBER INNER TUBES with mixture of glycerol and corn syrup, in equal parts, applied as a surface coating.

ACCELERATING VULCANIZATION by the addition of one per cent. of piperidine or one of its derivatives before heating with a vulcanizing agent in the usual manner.

SEPARATING VULCANIZED RUBBER FROM FABRIC by soaking the rubber-coated material in certain hydrocarbons of the Dutch East Indies, especially rich in saturated hydrocarbons of the cyclic and alicyclic series. Contact in the cold causes the vulcanized rubber to swell in time, losing its elastic property and changing into a colloidal mass. In this state the rubber is readily separable from the fabric and may then be regenerated by means suitable to its nature.

CONDENSITE-RUBBER MIXTURES SUITABLE FOR ELECTRIC INSULATION CABLES. Halogen substitution products of naphthalene are found to facilitate the mixing and combination of sulphur and rubber in the vulcanizing process, and they remain in the vulcanized product as a solid solution with modifying properties. The materials bind well and are but slightly inflammable. Hard rubber mixtures by this process are said to be less brittle than ordinary, even at low temperatures.

IMPREGNATING MATERIAL WITH RUBBER.—Reclaimed or regenerated rubber is adapted for impregnating fabrics by reduction to emulsions with solvent and water. If emulsions containing only regenerated rubber are used, the coated material must be dried before vulcanization.

IMPROVING LOW-GRADE CRUDE RUBBERS. The material is treated direct or after solution or softening with one or more alkali metals or their alloys—hydroxides or alcoholates in the dry form at temperatures not exceeding 212 degrees Fahrenheit. Regenerated rubber may also be treated in the same way. The rubber to be improved is intimately mixed on rolls in the proportion of 100 parts rubber with 5 parts of sodium, raising the temperature of the rolls to about 150 degrees to 160 degrees Fahrenheit. In a few minutes the mass begins to acquire the properties of high-grade rubber, not adhering to the rolls and working readily. The material is sheeted thin and allowed to remain for 24 hours at about 150 degrees. The sodium can be recovered after the operation is completed.

RUBBER AND EGG ALBUMEN. An emulsion is made by mixing three parts of fresh egg albumen with one part of a solution of crude rubber in benzene. This mixture should stand till thoroughly dried before further compounding on rolls with sulphur and other compounding ingredients for hot vulcanization.

A CURE FOR NATURAL OR ARTIFICIAL RUBBER. An English patent (No. 4,263, 1913) has been granted for a process of vulcanizing natural or artificial rubber. It consists of acceleration by the addition of small amounts of *p*. nitrosodimethylalanine or its homologues. A mixture of 100 parts rubber, 10 parts sulphur and one-half part of the above accelerator can be vulcanized in twenty minutes at 285 degrees Fahrenheit, as against one hour without the accelerator.

OBSERVATIONS AND COMPARATIVE TESTS ON THE LATEX OF WILD AND PLANTATION HEVEA.

The work of F. Ripean in this connection confirms the view that the high quality of Brazilian hard cure Pará is due to coagulation by the carbon dioxide present in the smoke employed. The author found that in coagulating *Hevea* latex by means of carbon dioxide obtained by burning charcoal a product was obtained equal to plantation smoked sheets, and it was also free from the impurities which impart to the latter its dark color. The process, which is said to have many advantages, is not easy to carry out in practice. Precautions mentioned include not allowing coagulation to occur naturally nor hastening by heating, or by addition of acids. The coagulum must not be subjected to mechanical working. Good results were obtained by the addition of creosote to the latex.

In the "Journal of the Society of Chemical Industry," April 15, 1915, pp. 34-37, W. A. Caspari writes of his researches in the behavior of colloids towards pure and mixed liquids. His results show indications, from experiment, that discontinuity between caoutchouc-benzene solution and caoutchouc-benzene gel exists in the neighborhood of one volume of caoutchouc and six volumes of benzene.

It is significant that the caoutchouc employed absorbed about six volumes of benzene before passing into solution.

MEASURING THE IMPERMEABILITY OF PROOFED CLOTH.

Cloth waterproofed by rubber proofing, impregnated with alum or other salts, is not completely impermeable to water. An instrument for determining the degree of impermeability has been devised. As described in a recent communication to the Society of Dyers and Colorists of England, it consists of a copper cylindrical box, to which are attached a glass measuring tube and a rubber bulb. On the top of the box are fixed (by means of two screws) two rings, one of copper and the other of rubber.

At the beginning of the experiment the box and the bulb are filled with water, and on the top of the box is fixed a piece of the cloth to be tested. By pressing the bulb the height of water in the glass tube is increased, and when the pressure is sufficient (20-30 cm.) small drops are observed to form on the surface of the cloth. The height of the water column measures the impermeability of the cloth.

THE SIROCCO-STURTEVANT INFRINGEMENT SUIT.

Seven years ago the Sirocco Engineering Co., which was afterwards absorbed by the American Blower Co., brought suit against the B. F. Sturtevant Co. claiming infringement of the Sirocco patents. Verdict was given to the American Blower Co. by the lower court and was appealed. Last December the Supreme Court of Appeals of the second circuit, which is the highest court in the land that can pass upon patent litigation, returned a verdict in favor of the B. F. Sturtevant Co., reversing the decision of the lower court. The court not only stated that the Sturtevant Company fan was not an infringement of the Sirocco patents, but it found that the Sirocco fan patents were not valid.

TEST FOR FINENESS OF PIGMENTS.

UNIFORM texture and dependable physical properties in high-grade rubber goods are influenced to an important extent, although not entirely controlled, by the degree of fineness of the mineral compounding ingredients employed in the mixing. The rubber manufacturer is also interested in the fineness of his pigments as a measure of economy, because the minuteness of the particles of a pigment is an important factor in extending its coloring power. To the paint manufacturer the problem of fineness of grinding is possibly of even greater importance, because it affects not only the efficiency of his own grinding machinery but the working qualities and color value of his product.

In the rubber, as in the paint trade, material is customarily purchased on an envelope sample representing the goods, and, speaking only of the rubber trade, the goods are commonly used without any further ado; except, of course, that in the case of special high-grade or otherwise important mixings, resort is had to sifting the dry ingredients through a fairly fine mesh to facilitate mixing and to insure removal of accidental impurities.

This is to be commended as a precautionary measure. It should be preceded by a careful standardized test for the acceptance of the various ingredients. In a recent issue of the "Oil, Paint and Drug Reporter" C. D. Holley and J. C. Brier have published their method of test for fineness of dry pigments, with tables showing the results obtained on a variety of materials, most of which are found among rubber makers' supplies.

The authors state that deciding upon a suitable degree of fineness of particles and maintaining an accepted standard in this respect leads to continued controversy between the manufacturer and the sources of his supply. This is due largely to the fact that the envelope samples, on which goods are purchased, do not fairly represent the deliveries. The necessity thus arises for a standard basis of fineness that can be designated numerically, and a standard screen has been employed for such measurement, having 350 meshes per inch, or 122,500 apertures per square inch. Such a screen is extremely efficient in separating particles of material expensive to grind. It has been demonstrated that particles which will pass through a 350 mesh undergo but little actual grinding in the paint mill, whereas the particles retained on such a screen, even though the percentage is comparatively small, dull the mills very rapidly and much reduce their output.

Weaving the material for the standard screen is difficult and expensive because of the precautions necessary to be observed to secure a uniform 350 mesh each way. Its manufacture has been successfully accomplished by the Multi-Metal Separating Screen Co., of New York. The wire used in its construction is vanadium bronze, one one-thousandth of an inch in diameter. The spacing of the warp is regulated by a reed consisting of 350 teeth per inch and uniformly spaced. The reed measures 36 inches long and contains 12,600 teeth. During the weaving the warp wires are kept stretched to the limit of their endurance to prevent shifting during the process of manufacture. The cross wires are placed at equal distances from each other in the weave, and the operator of the loom checks this spacing under a magnifying glass every eighth of an inch. The resulting fabric has been found sufficiently accurate for the intended purpose.

The method of testing a pigment with such a screen is simple and expeditious. A so-called master screen is kept as a standard, and whenever a new one is secured a practical test of the accuracy of the new screen is made by using both screens with a pigment that has a considerable percentage of coarse particles.

A gram sample of the pigment under examination is washed through the screen under the water tap, using a soft 1-inch brush to break up the lumps, brushing continually until only the coarse particles remain on the screen, which is then wiped dry on the under side in order to remove as much moisture as possible, then dried on a steam oven or hot plate. The dried residue remain-

ing on the screen is then weighed. If difficulty is experienced in getting the water to run through the screen when beginning a determination it is readily started by gently rubbing the under side of the screen with the fingers. As regards size, a screen 6 inches in diameter has been found very convenient.

By this test the manufacturer is enabled to put a definite numerical limit on the quantity of coarse particles he will permit in his raw materials. It also gives the pigment manufacturer a means of standardizing his manufacturing operations and of producing a uniform product.

The tabulated results of the author's tests by this method, conducted on commercial shipments of pigment, show wide variations in degree of fineness between lots of the same material supposed to be uniform. Among the materials represented, of interest to rubber manufacturers, are iron oxide, graphite, asbestos, china clay, silica, whiting, Paris white, ultramarine, white lead, Venetian red and others employed in the paint trade.

A modification of the above test, recommended in the case of calcium and manganese oxides, consists in using in place of water for washing, a basin of naphtha, placing the screen therein so it will be covered to the depth of half an inch, brushing the material through in the usual manner and finally washing off the adhering particles from the brush by means of a naphtha wash bottle.

The amount of service that can be expected from one of these screens is limited where a high degree of accuracy is required, especially where the pigments tested are strongly abrasive, such as silica and iron oxides. After one hundred determinations the screen should be tested against the master screen at frequent intervals. A stock of standard pigments is maintained for comparison with shipments, using the same screen for test purposes. For rapid testing of large shipments several standard screens are employed on composite samples representing packages in unit groups.

The standard maximum limit for particles coarser than 350 mesh in pigments for paint manufacturers' use is 2.7 per cent. No maximum limit of size is prescribed because of the further reduction by grinding in the process of paint manufacture. The figures shown in the tabulations presented by the authors demonstrate that their standard is practically attainable and might even be restricted to 1 per cent without imposing undue hardships on the pigment manufacturers.

MINERS' ELECTRIC LAMP.

The illustration shows a new miners' electric lamp that is said to be safe, strong, light in weight, simple in design, efficient in operation and of ample capacity. The outfit consists of a lead

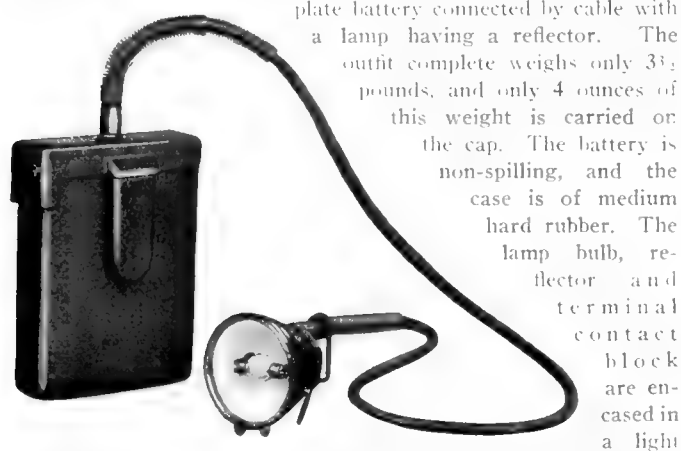


plate battery connected by cable with a lamp having a reflector. The outfit complete weighs only 3½ pounds, and only 4 ounces of this weight is carried on the cap. The battery is non-spilling, and the case is of medium hard rubber. The lamp bulb, reflector and terminal contact block are encased in a light

then heavily rubber covered, to render the cable strong, well-insulated and free from kinks. [General Electric Co., Schenectady, New York.]

INTERNATIONAL TIRE STANDARDS AND THE S. A. E.

At the meeting of April 20-22, at Detroit, of the Society of Automobile Engineers, the International Standards Division of the Society placed particular emphasis on the necessity for educational literature to present to the attention of foreign interests the advantages of international solid tire standards, and it was agreed that the Institution of Automobile Engineers and the Society of Motor Manufacturers and Traders of England should be consulted in this connection and their assistance obtained.

This division of the S. A. E. is composed of members resident in this country and abroad, and its object is the obviously beneficial one of harmonizing dimensions of American and European solid and pneumatic tires and making such tires interchangeable throughout the world. The solid tire situation has been selected for first attention. Standardization of the mounting of solid tires on motor trucks has already been effected, and the society has recommended concentration upon three diameters of tire only—32, 36 and 40-inch—as a means of reducing tire cost and to bring about the carrying of tires in stock at all necessary places. The majority of the American truck manufacturers are now using tires of these three diameters exclusively, in 3½, 4, 5 and 6-inch widths.

A WESTERN OPINION ON FIRE HOSE.

In an article on the subject of fire hose in the April quarterly of the National Fire Protection Association, Fire Marshal Harry W. Bringham, of Seattle, Washington, says: "With anything from a hand engine to a complete waterworks system, a fire department should use for throwing water only the standard hose of 2½-inch interior diameter. The saving in cost of smaller sizes counts for little in comparison with the disadvantages. Under conditions in which one pound of pressure is lost by friction to each 100 feet of 2½-inch hose, about three pounds are lost in 2-inch and more than ten in 1½-inch."

Continuing, he says that rubber, or "canvas" hose is more expensive than cotton hose, heavier, less pliable and not so strong, but that, on the other hand, there is no outside fabric and nothing to dry after using, hence a double supply for each hose cart is not needed. He states that first-class rubber hose has lasted in volunteer fire departments longer than high-grade cotton, with very little care, but that only the best quality can give such results. Cotton hose, he claims, is strong, flexible and the popular favorite, but the fabric must be carefully cleaned and dried after using, so that an extra supply should always be kept on hand to put on the cart or reels while this is being done. He says that there can hardly be too much care given to cotton hose—that as soon as the lining gives way the hose becomes weak at that point and worthless, and that the lining itself is best kept cool and moist.

In conclusion, he recommends the use of the specifications approved by the National Board of Fire Underwriters, to hose purchasers, as being reasonable and fair.

MOTION PICTURES OF TESTS ON RUBBER COVERED WIRE.

The National Fire Protection Association has recently prepared a series of motion pictures illustrating the tests carried on at the Underwriters' Laboratories in Chicago. These pictures are available for use in educational work in connection with accident prevention. The Laboratories' tests on rubber-coated wire are very completely covered in these pictures, which show engineers making the measurements prescribed in the National Electrical Code, preparing samples for voltage breakdown and wrapping tests, and such other features as can well be illustrated.

New Rubber Goods in the Market.

THE NEW YORK TRAFFIC SQUAD IN WHITE RUBBER UNIFORMS.

AN experiment of importance to the rubber trade is now being made in New York City. It consists in trying out a new rainy day uniform for the police traffic squad. A certain number of these men have been allowed to discard their black helmets and raincoats, and in their place to don white rubber uniforms, which distinguish them at a very considerable distance and assist both officers and drivers of vehicles in the regulation of traffic. The illustration shows a traffic policeman in one of the new uniforms, with boots, coat and cap cover all of white rubber. These uniforms have been submitted as samples, following a suggestion made in a recent traffic conference at New York police headquarters on complaints that drivers were unable at any distance on foggy or rainy days to distinguish policemen from street railway employes and pedestrians. This is an argument that can scarcely be offered in excuse for violation of traffic regulations or orders at the corners presided over by these white-clad policemen. Should the experiment work out to the satisfaction of the department interesting possibilities would be opened to dealers in rubber goods not only in New York, but in all other large cities. [The B. F. Goodrich Co., Akron, Ohio.]



Copyright Uniforms, B. F. Goodrich Co., N. Y.

"TWO-PART" FIRE HOSE.

Fire hose made in two parts, an outer casing and an inner tube, either of which can be repaired or replaced when worn, is a new and decidedly interesting development. The lining or inner tube is made specially strong at either side, where the bend comes, by reinforcements of rubberized duck, the spaces between giving it elasticity. This is to overcome the liability of hose to crack at the sides when folded over. It is also made strong at the bends or where it is turned back at each end of



the wagon, where the severest strain comes. This lining is inserted in the cotton jacket, to which it is fastened only at the couplings.

Not only can the inner tube be removed and a new one substituted, but it can be repaired, exactly as a tire tube, while in the event of injury to the casing from burning or any of the

various accidents to which it is liable, it can be replaced at about half the cost of the hose. By this mode of manufacture, also, a new lining can be supplied at nominal cost for any fire hose now in service in which the lining has become worn or useless. The manufacturers believe this new hose to be durable, practical, economical and a great advance in the art of hose manufacture. [Chicago Fire Hose Co., Chicago.]

TIRE INFLATING AND GAS TUBING.

The accompanying illustrations show two new types of flexible tubing. The first, or tire inflating type, is made with an armor of interwoven galvanized steel wire over a heavy rubber tube. This armor protects the rubber tubing, enabling it to stand a pressure up to 200 pounds, without in any sense decreasing its



flexibility. The other is a new type of rubber packed flexible metal gas tubing. The sides of the metal strip are brought close together in the winding, and a rubber thread lies in the groove thus formed. This tubing has been brought out to meet the great demand for a flexible metal gas tubing that will not leak. It is different in contour from the usual American type, following in style the German product—than which it is said to be even a little more flexible—now unobtainable on account of war conditions. [Breeze Carbureter Co., 250-252 South street, Jersey City, New Jersey.]



DENTAL POLISHERS AND MEDICINE CUPS OF RUBBER.

In dental work a rubber polisher, attached to and operated by a mandrel, is applied to the teeth, the soft rubber surface spreading itself out and conforming to their contours. A screw embedded in the soft rubber forms the means by which it is attached to the mandrel. These polishers are made in several different shapes, so that every portion of the tooth can be reached. The small cut herewith shows a new type, called the "B S," for use in polishing the necks and roots of teeth. Another rubber device in use in the dental office is the counter-irritant cup, a soft rubber suction cup for the application of medicines to the gums over the roots of teeth, after the filling of root canals and in cases of inflammation. The rubber suction cup, with its inner or concave surface medicated as required, is applied to the gums, the remedy proving much more effective than would be the case were it simply applied and then allowed to spread over the mouth.



Purified gutta percha is the basis of "Oleo-Percha," a composition described by its makers as "the one perfect canal sealing and the only root sealing made from the best grade of pure gutta percha." This preparation is made by a non-secret formula, the gutta percha being purified by methods peculiar to this particular company. [Young Dental Manufacturing Co., St. Louis, Missouri.]

RUBBER STAMP ACCESSORIES.

The stationery stores constitute an important market for rubber goods, the office use of rubber being very large, as also the variety of articles comprising lines of rubber goods for the stationers' trade. Here are shown three new and extremely

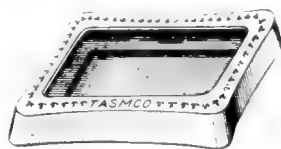


useful office specialties. One is a stamp and pad cleaner, something that is sure to be highly appreciated. With the exception of the handle, this is made entirely of rubber. On one side it is a brush, with hexagonal rubber teeth for cleaning the rubber stamp, while on the other side is a three-blade rubber scraper for cleaning the ink pad and also for distributing the ink when reinking the pad.



Another device is the rubber band protector. Everybody who has operated the wheel stamps so largely in use in offices for numbering, making folios, etc., knows what a strain their continued use is on the hand. To relieve this strain this cushion of soft rubber is slipped over the top of the stamp, being adapted to fit all stamps of

this variety. The third illustration is of a rubber base for daters such as are used in railroad offices, and under corporation and other seals, check protectors, etc., to prevent slipping and scratching of the desk. [The J. F. W. Dorman Co., Baltimore.]



THE NEW O'SULLIVAN HEEL.

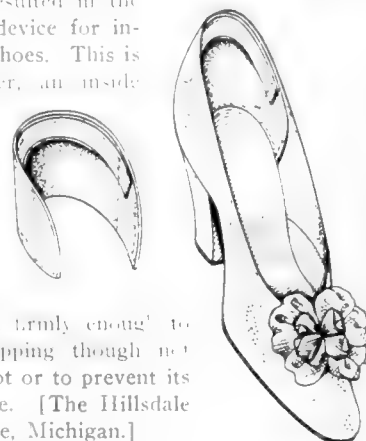
The rubber heel as a rule has not been a thing of beauty, though American heels have perhaps been the least noticeable in this respect. As an example, the English revolving heel added nothing to the appearance of the shoe and was never very popular in the United States. The latest advance in rubber heels comes through the O'Sullivan company, which has provided dainty rubber heels, in colors, for women's shoes. They are black, tan and white and



can be put on the latest fashionable heels and finished so that they are practically indistinguishable from leather. [O'Sullivan Rubber Co., 131 Hudson street, New York.]

A RUBBER BAND TO KEEP THE SHOE IN PLACE.

The annoying tendency of low shoes, and especially pumps, to slip at the heel, with the incidental annoyance of worn hosiery, due to this slipping, has resulted in the introduction of a non-slip device for insertion in the heels of low shoes. This is the D & B Shoe Retainer, an inside counter-shaped affair made of sheepskin and rubber and gummed at the back for quick and easy attachment to the shoe heel. A rubber band is stitched in the top of the retainer, as shown in the illustration, this band gripping the heel firmly enough to prevent the shoe from slipping though not tight enough to hurt the foot or to prevent its easy insertion into the shoe. [The Hillsdale Shoe Retainer Co., Hillsdale, Michigan.]



DOMINION RAINCOATS.

In recent issues of THE INDIA RUBBER WORLD there have been illustrated up-to-date raincoats made in the United States. The illustrations herewith show similar garments in styles just brought out by a Canadian rubber goods manufacturing concern and which have been approved by Canadian consumers. The man's coat, which is produced both in lightweight cashmere and in tweed, is for the automobilist, being made with a full skirt, designed to completely cover the knees when driving. It has a military collar and raglan sleeves with very deep one-piece eye

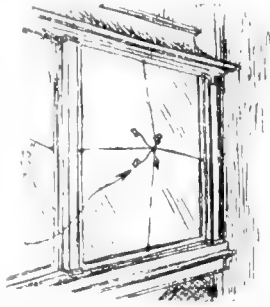


to give free arm movement. The seams are double strapped and stitched, inside and out. And to further distinguish it from the ordinary and commonplace it has been given the name of "Kitchener-Special."

The little girl's outfit includes a detachable hat, as shown, with a shield front and drawn in with elastic at the back to fit close to the head. The "Duchess" coat for women has the Inverness, or wing sleeve, for ventilation. It is made in lightweight plain and fancy single texture cashmere, in silks, in gabardines and in Donegal tweeds. It is stitched throughout and cemented, has a half-roll collar, is ornamented back and front with buttons and is piped with velvet around the arm, back, front and collar, making an altogether attractive rainy-day garment. [Canadian Consolidated Rubber Co., Limited, Montreal, Quebec.]

A SPIDER WITH RUBBER FEET.

The blast buffer is an invention for the protection of plate glass windows in buildings liable to vibration from blasting or other causes. It is made of bent steel rods, to the four ends of which are attached flat steel pieces 2 inches long and 1 inch wide, and covered with rubber pads. It is held in place against the plate glass by wire rods attached to eye screws in the window frame, just enough tension being applied to resist vibration. It is applicable alike to the inside or outside of the window, or in extreme cases, or where the window is of exceptional size, it is used on both sides, with the pads directly opposite each other on the glass.



A NEW SIMPLEX BATTERY-METER.

The No. 4 is a new type of battery-meter especially adapted for the use of automobilists in testing the strength of battery solutions. The use of the rubber bulb is in drawing a sufficient quantity of the solution into the battery-meter to float the hydrometer, the reading being taken by noting the point on the scale in the stem at which the hydrometer floats. A fully charged battery should show a density of 1.280, and would be exhausted at 1.150; one which reads 1.250 when fully charged is exhausted at 1.100. The solution in batteries which show at full charge readings higher than 1.300 or lower than 1.250 should be diluted, in the one case, and in the other, strengthened by the addition of a solution of sulphuric acid. This new type is 10½ inches in length, and is furnished in a wooden box with a hinged cover. Extra or worn parts, including the rubber bulb, can be supplied at any time. [Simplex Hydrometer Co., Newark, New Jersey]

A NEW RAJAH SPARK PLUG.

The special features which distinguish the new waterproof Rajah spark plug from the regulation device of its kind manufactured by this company, are the special nipple covering the clip terminal on the cable and the protecting part screwed to the plug bushing—this latter being made of a hard rubber substitute of high heat-resisting properties. The company guarantees this plug, which is furnished in all the standard sizes, with a Rajah regular terminal to fit any cable, or with ferule terminals where a sample of cable is supplied—to be absolutely waterproof. [Rajah Auto-Supply Co., Bloomfield, New Jersey.]

RUBBER TOP LIFTS FOR WOOD HEELS

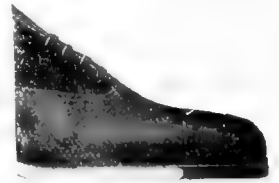
According to a late issue of the "Boot & Shoe Reporter," the idea of a half or full Louis heel with rubber top lift has been developed to a considerable extent in connection with the manufacture of women's shoes, and concerns making rubber heels are producing these lifts for the wood heel makers. Additional elasticity over the old style wood heel with leather lift, with consequent increased comfort, is claimed.

TIRE ALARM.

American rights have been secured in a French device known as the "Cri-Cri," which is designed to notify motorists of the softening of their tires. One end of a steel strip comes in contact with the side of the tire, the other is held fast in a clamp that hooks under the rim and is braced against the felloe of the wheel. When the tire becomes soft the strip buckles, making a sharp, metallic noise. [S. S. Seider, Box 308, Rolfe, Iowa.]

THE DU-FLEX SOLE WITH THE "RFISISTOE" TIP.

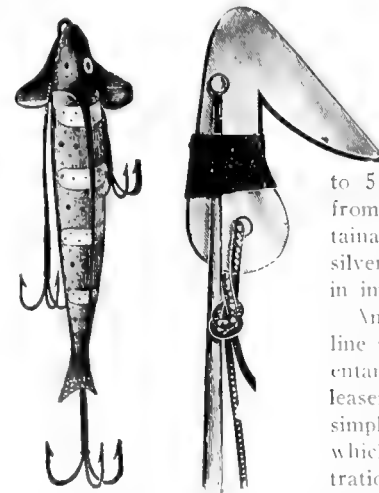
The manufacturers of Snowflake Du-Flex soles have brought out a novelty in this connection in the form of a white sole with a black "double wear" toe made of tough, fibrous compound. This tip is not veneered, but is a part of the sole, extending through its entire thickness, the vulcanization of the curved, welded union insuring a joint which the makers guarantee to remain intact and not to pull apart. Du-Flex soles may be applied to the shoe with the same short stitch that is used on the leather sole. [Ayon Sole Co., Ayon, Massachusetts.]



NEW MILLS FISHING SPECIALTIES.

A new phantom minnow has appeared, slightly in advance of the season for black bass, for which it is especially recommended, but just in time for pickerel fishing, in which its use will be appreciated. It is made of silk, coated with rubber, in sizes from 13g

to 5 inches long, and retails at from 35 to 75 cents, being obtainable with brown spots, blue, silver, with light green stripes and in imitation of whitebait.



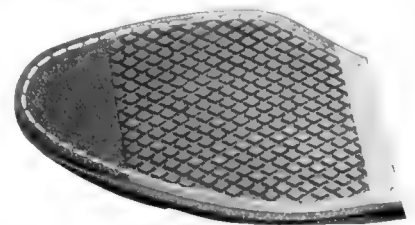
And for the fisherman whose line is inclined toward distracting entanglements, an improved "re-releaser" is now being offered, the simplicity and practical nature of which is suggested by the illustration. This shows the wide rubber band under which the tip

of the rod is inserted and which holds the rod firmly while the releaser is being raised to the detaining twig. Then the rod is withdrawn, a slight pull on the cord cutting the twig and freeing the line. [William Mills & Son, 21 Park Place, New York.]

THE STUB-PROOF TIPPED RUBBER SOLE.

A new tip has been introduced in connection with Goodyear "All Weather Tread" soles, which is called the Stub-Proof. This tip is of fiber and rubber and is made an integral part of the sole by vulcanization, so that it cannot crack off, a possibility that presented itself in the case of the old style leather-tipped rubber soles. It

is also claimed for it that it will not wear away as rapidly as the leather toe, because of its resilient composition. [The Goodyear Tire & Rubber Co., Akron, Ohio.]



"Nodelay" is a new puncture repair solution. It is described as an emulsion, not a filler, and it is poured through the valve stem into the inner tube, on the entire inner surface of which it forms a thin membrane which, it is claimed, prevents leakage of air due to punctures. [Nodelay Manufacturing Co., Chicago.]

"Brevet" is a new outdoor game of more than ordinary fascination. It is played on the lawn with a ball and rubber-headed mallets, and as its enjoyment depends neither upon unusual skill nor athletic practice, a wide field is open to its introduction. [F. Regal, 529 Maroning avenue, Warren, Ohio.]

The Editor's Book Table.

TECHNICAL METHODS OF CHEMICAL ANALYSIS. VOL. III, 3 parts. Edited by George Lunge, Ph.D. (English translation, edited by Charles A. Keane, D.Sc., Ph.D., D. Van Nostrand & Co., New York. [Large octavo, 1,125 pages. \$18 net for two parts.]

THIS well-known reference work is highly esteemed by analysts in every branch of chemical technology, because it represents tested results by many of the leading technologists in chemical and allied industries, consolidated by competent editors into a well-planned, systematic whole. Seventy-three collaborators are represented in the present volume.

Rubber chemists will find Volume III of special interest because it contains a section of fifty odd pages devoted to rubber and rubber goods. In the sections treating of Oils, Waxes, Resins, Textile Fibres and Inorganic Colors, they will also find much valuable information on matters intimately connected with the manufacture of rubber goods.

The contents of the volume are as follows:

Part 1—Mineral Oils, Lubricants, Fats, Waxes, Organic Preparations, India Rubber, Vegetable Tanning Materials, Leather and Inks.

Part 2 Sugar, Starch and Dextrin; Alcohol, Spirits and Liqueurs, Vinegar, Wine, Brewing Materials and Beer; Paper, Textile Fibres and Inorganic Colors.

A brief description of the nature and technology of each material precedes the detailed account and discussion of its appropriate analytic methods. In the section devoted to the consideration of the rubber industry, Messrs. Frank, Marckwald and Caspari present a clear and concise account of their subject under four general divisions, as follows:

A—The sources and chemical nature of crude rubber and its examination previous to manufacture. This is followed by detailed analytic methods for the determination of resin, moisture, ash, rubber (by tetrabromide and nitrosite methods) and protein, concluding with remarks on hot and cold vulcanization.

B—Accessory materials of the industry. A list of about sixty of the more important compounding ingredients is given and classified into organic and inorganic fillers. Regarding certain of these materials useful data are given, particularly concerning substitutes, both white and brown or black. Especial consideration is given to the chemical nature of oil substitutes, their manufacture and a scheme for their analysis is outlined.

C—The analysis of rubber goods. Under this head it is noted that the correct interpretation of a complex analysis of manufactured rubber is largely a matter of experience, since few of the analytic results correspond directly with substances originally forming part of the mixing. The reasons indicated are, first, that analysis can divide up the rubber only into chemical groups, and not into raw materials; and, second, rubber mixings of any very great simplicity rarely occur. A scheme of statement for an analysis is shown in which all percentages are calculated upon the original material.

Very full and explicit methods of analysis are detailed for every determination required, with references to original sources. This is followed by a general scheme of analysis in a series of four tables, with notes and comments on interpretation and statement of results.

The examination of cable insulation, in conformity with specifications, is treated separately. The section closes with pertinent remarks on analysis of proofed fabrics, rubber solutions, determination of specific gravities and microscopic examinations.

D—Empirical tests applied to rubber goods. These are classified and described as chemical and physical.

A list of nineteen such tests is given in detail. Several important machines of European manufacture, designed for tensile testing, are illustrated.

In closing the authors treat briefly of gutta percha and balata and give a series of tests for those materials. The work is provided with an appendix of tables for reference drawn from the text, also with a well-arranged index of subject matter and of authors' names.

THE UTILIZATION OF WASTE PRODUCTS. By Dr. Hugo Koenig. Second revised English edition, 1913. Scott, Greenwood & Son, London; D. Van Nostrand Co., New York. [Cloth, 8vo., 26 pages. Illustrated. Price, \$3.00 net, and six cents duty.]

The author gives brief accounts of waste recovery in many lines of manufacture, compiled from a vast bulk of technical literature.

The scope of the work is very large, covering 59 different subjects. Naturally in so ambitious an attempt the matter is rather brief and to an extent largely historical. It is impossible, also, in preparing a work of this sort, to compete with specialists in their up-to-date treatment of specific subjects. On india rubber, for example, the chapter on reclaiming adds nothing to the existing knowledge; indeed, when one considers the progress made in the last year or two, it can hardly be called up to date. A work of this sort, however, has its value in gathering together briefly much that has been done in utilizing the world's waste.

NEW TRADE PUBLICATIONS.

A NEW VOORHEES CATALOG.

The new catalog of the Voorhees Rubber Manufacturing Co., of Jersey City, New Jersey, is more than ordinarily interesting. Its 89 pages are well and generously illustrated, and the descriptions clear in showing the qualities which make Voorhees rubber goods particularly desirable in various uses. Besides rubber belting, hose and packing, which occupy chief prominence, gaskets, tubing, mats, stair treads and all the many items that go to make up a complete line of mechanical rubber goods, are given mention. This company has a special department devoted to the manufacture of candy molds, while another of its more unusual productions, and one especially interesting at this time, is the rubber shell for artillery practice. In addition to the 29 items with 52 sub-items contained in the index, the company is prepared to furnish estimates on any special lines, novelties or articles for unusual or peculiar requirements.

THE FIRESTONE CALENDAR FOR 1915.

The Firestone Tire & Rubber Co., of Akron, has issued its yearly calendar, which, following its usual style, commences with February and ends with January. It is in the form of a large four-page panel hanger, each page containing a calendar for three months besides a reproduction in colors of a painting by E. W. Pirson, the artist to whose work the Firestone calendars owe much of their very genuine charm. Each panel calls attention to a particular type of tire—the Firestone non-skid for pleasure vehicles, the motorcycle tire, the carriage tire and the truck tire and each painting reproduced includes a vehicle equipped with one of these types of tires in most appropriate surroundings.

DOMINION TIRES AND TIRE ACCESSORIES.

Under this title the Canadian Consolidated Rubber Co., Limited, has published a handsome catalogue of 40 pages covering practically all rubber articles used in connection with automobiles, cycles and motorcycles. The "Nobby" and "Chain" non-skid and the "Dominion" plain tread tires are illustrated and described in detail. A weight schedule instructs car owners

as the proper size of tire for their machines. Tire sundries are fully described and illustrated, including "Heal-a-Cut" plastic compound, reliners, self-cementing patches, rebuilding fabrics, tire tube tape, tire irons, pump valves, pressure gages and rubber humpers. Straight side casings, of late very popular, have not been neglected by the Dammun company, which offers them in "Nobby," "Chain" and plain treads in all standard sizes, and furthermore manufactures special rim fillers to enable owners of old cars to use straight side casings.

SOME INTERESTING LETTERS FROM OUR READERS.

THINKS GERMANY IS NOT GETTING FAIR PLAY.

TO the Editor of THE INDIA RUBBER WORLD:

As a constant reader of your very valuable journal, and for many years so, I am afforded the opportunity of reading also your article on page 241 of the February number dealing with "The Rubber Trade on Guard."

Whilst acknowledging your perfect freedom to do and write whatever you like, I think I may justly trespass upon your courtesy and ask you, since you are talking of the obligation to play fair with England in the matter of rubber export, if you are of the opinion that other nations, engaged or not in the war, must take a back seat in the playhouse of American neutrality.

I think for the sake of fair play, fair play should be strictly observed in all directions and not in favor of one nation only.

This war will have an end, as all wars have had, and it would be pitiful if after the war we should have to bear in mind that fair play was on the other side of the ocean only a matter printed on paper.

Are you familiar with the fact that even now-a-days history is taught in school in England as follows: "The great war of the American Rebellion?" In Austria-Hungary and in Germany it is taught as follows: "The war of the American Independence."

What a pity that there are no men living like Franklin, Washington and the many dozens of the other great Americans.

Yours very sincerely,

Vienna, March 6, 1915

GUSTAV HACKER.

A BRIGHTER VIEW OF DUTCH GUIANA.

TO THE EDITOR OF THE INDIA RUBBER WORLD

In your issue of April 1 is an article by your "Regular Correspondent," headed "Trade Opportunities in Dutch Guiana," and in it there are many statements that are not only misleading, but absolutely incorrect, that it does this colony a great injustice, and it seems to me that they should be refuted at once.

Referring to the first item, the balata industry has not ceased to be. Within the last few weeks I have known of 280 men being contracted, and sent to the bush to bleed trees. One more company now has 140 men under contract here in the city, and these will be sent to the bush at once. Nearly every day witnesses the departure of one or more parties for the bush; and while the price of this article is somewhat below the average, these large companies must see a profit ahead or they would not send these men to the bush. Every boat that leaves this port for Europe takes some of this product, it having been taken off the contraband list.

The statement that "cocoa, coffee, bananas, rubber, etc., are overflowing the local market," is absurd. Cocoa is eagerly bought here by large exporting firms, and the local price of 95c. Dutch, per K. G., is the best obtained in a good many years. Coffee is shipped on every boat to the United States, where it brings at present about 16c., American, per pound. There is no rubber to be bought here, for the reason that there is very little produced in the colony, the majority of trees not yet having

attained the required size for tapping. The outlook for well conducted plantations is bright, and has not been so good for years.

The great trouble in Suriname is that there is a large class of people here who do not care to make their living by work, and while everyone will admit that times are not just what they should be, there is plenty of work to be had here. The fact that the planters of this colony have to import thousands of indentured laborers from British India and Java, at a very high price per head, speaks for itself.

As to the new balata ordinance, it has not been in operation for a sufficient length of time to be able to comment on its faults or virtues, but the fact that it has tended to cut down the amount of advances made to laborers before entering the bush, and has at least tried to curtail the wholesale stealing of balata, has made it very unpopular with a certain class of the laboring population.

Hoping that you will give this article space in your valued journal, and hoping that it will help to correct some of the erroneous statements in the letter of your regular correspondent,

I am, very sincerely yours,

(Signed) J. S. LAWTON.

Paramaribo, April 30, 1915.

FOOTWEAR FOR THE MOUNTAINS.

A writer who contributes an article on mountain camping and its proper equipment to a recent issue of the "Saturday Evening Post" describes the proper sort of footwear for such outings, as follows:

"A very useful form of footwear for almost any sort of wilderness travel is the leather-topped, rubber-footed shoe, with a corrugated sole. You can get them with heels, also, if you like. Until worn smooth they hold very well on the rocks. It is always more or less damp round camp—even in the mountains—from dew or the like. If you have on a couple of pairs of heavy stockings and these waterproof boots or moccasins, you can hunt in rain or snow, and be comfortable in the evening or in the morning dew, when you go out to hunt the horses—which naturally always are lost."

It is very evident from the above description that the writer had in mind and had also had in use a pair of the famous Barker Hunting Shoes.

A NEW CANADIAN RUBBER COMPANY.

The F. E. Partridge Rubber Co. has been formed in Montreal, to manufacture rubber sundries and specialties for the wholesale drug trade, automobile tires and tire accessories of all kinds. F. E. Partridge, who on March 1 resigned from the vice-presidency of the Canadian Consolidated Rubber Co., Limited, with which he had been associated for the past ten years, is the head of the new concern, which has established offices at 146 Iberville street, Montreal. Previous to his connection with the Canadian Consolidated company, Mr. Partridge was for ten years actively interested in rubber manufacture in the United States, where he was associated with some of the largest concerns engaged in that line.

The firm of Congdon, Marsh, Limited, of Winnipeg, Manitoba, is opening a branch warehouse at Edmonton, Alberta, for the distribution of its shoe product and of Miner rubbers, made by the Miner Rubber Co., Limited, of Granby, Quebec. The Congdon, Marsh concern is sole distributor of Miner rubbers in western Canada.

The Chicago branch of the New York Belting & Packing Co. on May 1 moved from its old quarters at 130 West Lake street to a new store at 124 126 West Lake street.

The Obituary Record.

JOHN D. VERMEULE.

WHEN John D. Vermeule, for thirty two years president of Goodyear's India Rubber Glove Manufacturing Co., passed away, May 18, a career without parallel in length of active association with the rubber trade came to a close. He was connected with rubber manufacture for 72 years, actively so with the exception of the last four or five years, and holding during the whole of that time a position of the first importance.

Mr. Vermeule was born in Plainfield, New Jersey, September 22, 1822. He came from the best stock of Holland, the first of his ancestors to come to America being Adrian Vermeule, who took up his abode in Harlem in 1699. He was town clerk and also officiated as lecturer in the Dutch Reformed Church. One of his sons and four of his grandsons fought in the war of the revolution, and one of these grandsons was the grandfather of John D. Vermeule; from which it will be perceived that he came logically by those sturdy Dutch traits of industry, honesty and self-reliance, which were such conspicuous traits in his character.

He remained at school until he was 18 and then embarked on a commercial career as clerk in a New Brunswick store. Four years later, in 1844, Goodyear's India Rubber Glove Manufacturing Co. was organized, and Mr. Vermeule, then but 22, joined the new rubber company. He occupied an important position from the start and in time became the company's largest stockholder. In 1877 he was elected its treasurer, and in 1882 its president, an office which he held continuously until last August, when he relinquished it to younger hands. He continued, however, as a director in that company, and also as a director in Goodyear's Metallic Rubber Shoe Co., and retained his place in the directorate of the United States Rubber Co., a member of whose board he had been since the formation of that corporation in 1893.

It is hardly necessary to refer to the great success of the Glove company under Mr. Vermeule's long management. It achieved, many years ago, a reputation of which any company might well be proud. This was due not only to Mr. Vermeule's executive ability and personal standing, but to the fine judgment with which he selected his assistants; among them, for instance, being the late Clinton Van Vliet, so many years his selling agent, and F. F. Schaffer, long his factory superintendent and now president of the company.

Mr. Vermeule had many large interests outside of rubber. He was for some years president of the Holland Trust Co., vice-president of the American Savings & Loan Association and director in the Chatham and Phoenix National Banks. The enterprise, however, in which he was most deeply interested outside of rubber manufacture was the York Cliffs Improvement Co., which acquired a valuable tract of land at York Cliffs, Maine

Mr. Vermeule was president of this company, and it was chiefly due to his energy that the property was developed into a popular summer resort. In addition to building a fine hotel he erected a summer residence for himself which was one of the most attractive spots along the Maine coast.

He was one of the patrons of the Metropolitan Museum of Art in New York and had a personal collection of particularly fine paintings, and also a notable library. He married, in 1846, Miss Mary C. Kelley, daughter of a prominent Philadelphia merchant. She died some years ago, and during the last years of his life he lived with a niece in Staten Island. This niece, Mrs. J. B. Austin, and her brother, Edward Vermeule, of Plainfield, New Jersey, are his nearest surviving relatives.

JOHN P. RIDER.

To have been actively and prominently associated with an important and successful industrial corporation continuously for 52 years is an unusual record, but this distinction belongs to John P. Rider, formerly president of the New York Rubber Co., who passed away, in his 81st year, at his home in Beacon, New York, May 15.

Mr. Rider was born at Rhinebeck, only a few miles away from Beacon and in the same county, January 28, 1835. He graduated from the local schools, and at the age of 16 was hard at work in a store belonging to an uncle in a neighboring town. Two years later he returned to Rhinebeck to assist his father, who had just been appointed postmaster in that village. It shows what a long period this active life covered when the fact is recalled that this postal appointment was made by President Pierce. After distributing letters for his neighbors for a couple of years he went, at the age of 20, down to the city of New York, which opened up a larger field of possibilities than his native village afforded. Here he became connected with a wholesale house, and some eight years later, in 1863, left that to accept a position with the New York Rubber Co., an association he was destined to continue for over half a century.

In the following year he was made secretary of the company, and filled that position until 1883, when he was elected vice-president. That position he filled for 23 years, when, on the death of the company's president, in 1906, he was made the chief executive of the corporation, remaining its president until 1911, when, because of advancing years and a desire to lighten his business burden, he resigned. The company, however, was not disposed to lose his services altogether, and he was made chairman of the board of trustees.

As throwing some light on the opinion entertained of him by



JOHN D. VERMEULE



JOHN P. RIDER.

the people with whom he had been associated so many years, resolutions passed by the board of directors at the time of his resignation are interesting. These resolutions, after a suitable preamble, continue: "It is unanimously resolved that this board looks back with great pride and satisfaction to this long period of faithful service to the company by Mr. Rider, that the prosperity of the company during this long period has been largely due to the ability, fidelity and zest of Mr. Rider in its behalf." The resolutions go on to give expression to the regret the directors felt in his resignation, which was tempered, however, by the satisfaction of knowing that, as chairman of the trustees, he would continue to give the company the benefit of his experience and advice.

The rubber industry, while it dominated his activities, did not absolutely engross them, for he devoted considerable time to banking, in the town of Beacon, which during the last 35 years of his life had been his home. He was one of the organizers, in 1893, of the Matteawan National Bank and was its vice-president from that time until 1909, when he became president, retaining that position until last January, when, being in his 81st year, he felt that he ought not to be asked longer to discharge the duties of the office.

He was prominent in the civic life of the community in which he lived and was several times elected supervisor of the town. On the day of his death the local daily devoted two columns to the story of his life and had much to say regarding his services to the community for the third of a century during which he had made it his home. He was also exceedingly prominent in Masonic circles, having attained to the 32nd degree and being a member not only of the local lodge but of various Masonic lodges in New York City.

The surviving members of his family consist of a sister, two grandchildren and two great-grandchildren.

WILLIAM R. THROPP.

William R. Thropp, president of William R. Thropp & Sons' Co., died May 26 at his home in Trenton, New Jersey, from a complication of diseases, at the age of 58 years.

He was born in Trenton, receiving his education in the schools of that city. In 1879, at the age of 22, having completed a four-year course in machinery and engineering, he became associated with his father, the late John E. Thropp, in the manufacture of rubber mill machinery. He was made superintendent of the plant, a position which he occupied for ten years. In January, 1890, he discontinued this association and engaged independently in a similar line of manufacture, erecting a factory building on East State street, Trenton, which formed the nucleus of the present extensive plant of the William R. Thropp & Sons' Co., one of the most prominent and widely known concerns engaged in this important line of manufacture.

Mr. Thropp was a member of the Masonic order, being affiliated with Trenton Lodge, the Three-Times Three Chapter, Palestine Commandry and Crescent Temple of the Mystic Shrine.

He is survived by his wife, a daughter and two sons—John E. and Joseph W.—who were associated with him in business.

MAJOR ELIOT C. PIERCE.

So many years have elapsed since Major Eliot C. Pierce, who died at his home in Weymouth, Massachusetts, May 21, was active in the rubber industry that many men in the trade may not recall his connection with it, but as a matter of fact Major Pierce was one of the pioneers in the rubber reclaiming industry. He, with his brother, J. C. Pierce, formed the Pierce Rubber Co., shortly after the Civil War and at one time had a very sizable plant at Danversport, Massachusetts. The company, however, went out of business about twenty years ago, and after that time Major Pierce had no further association with this industry.

Major Pierce was born in Braintree, Massachusetts, February

14, 1831. He served with great distinction in the Civil War, taking part in every battle fought by the Army of the Potomac with the exception of Antietam. He did not engage in that as he was out on a furlough because of wounds received at Bull Run. For gallant service he was promoted to a captaincy and later made a major, and it was believed that during his last years he was the only surviving officer of the regiment to which he belonged.

MARSHALL CUSHING.

Marshall Cushing, who died at the Post-Graduate Hospital in New York, May 12, as a result of an operation for appendicitis, was never directly connected with the rubber trade, but as he was for some years secretary of the National Association of Manufacturers, he was well known to many manufacturers of rubber products who were members of that association.

Mr. Cushing was born in Hingham, Massachusetts, in 1860, and graduated from Harvard College in 1883. He had a notable newspaper experience, first as editorial writer on the "Boston Globe," and later as founder of the "Washington Times," and editor of the "New York Press." In the meantime he had acted as private secretary to Senator Lodge, and also to John Wanamaker, when he was postmaster-general. Later Mr. Cushing became secretary of the National Association of Manufacturers, and continued up to the time of his death as editor and publisher of "How," a magazine published in the general interest of manufacturers.

HEINRICH BRUCK

Heinrich Bruck, who for many years was general manager of the Leipsic Rubber Works, Leipsic, Germany, passed away, April 22. He was 73 years old and had been connected with this company since 1864, when it was known as Julius Marx, Heine & Co. He began as domestic and foreign traveling salesman, and was soon taken into partnership. He was always especially active in the export department of the Leipsic Rubber Works, and this he made the company's most important department. He became general director in 1913. In the death of Mr. Bruck the German rubber industry loses one of its oldest and most distinguished members, and the founder of the surgical branch of that industry.

RUBBER MEN ON THE "LUSITANIA."

Among the passengers on the ill-fated "Lusitania," which was torpedoed by the Germans, May 7, there were three men connected with the rubber trade, namely: Arthur H. Adams, of London; Arthur R. Foley, of Trenton; William H. Brown, of Buffalo.

ARTHUR H. ADAMS.

Arthur H. Adams, one of the victims of the "Lusitania" disaster, was on his way from a visit to his parents in Newton, Massachusetts, to London, which had been his home for some years and where he represented the interests of the United States Rubber Co. He was about 40 years of age and a graduate of the Massachusetts Institute of Technology. He first went abroad as an electrical engineer, but later became identified with American rubber interests. He succeeded in escaping, with his nineteen-year-old son, from the ship, and was in a lifeboat when it was struck by one of the "Lusitania's" masts. The boy was saved, but the father was knocked from the boat into the water and perished.

ARTHUR R. FOLEY.

Another victim of the sinking of the "Lusitania" was Arthur R. Foley, of the Home Rubber Co., of Trenton, New Jersey. Mr. Foley joined the selling department of that company in 1891. At first he confined his attention to the New York City trade, but proving to be a successful salesman, his territory was gradually enlarged until his travels carried him all over the United States, and during the last few years he had given quite a little time to the company's foreign business, particularly its

interests in England. Before the voyage which terminated so tragically, he had four times visited the company's London office, and he was widely known in the rubber trade on both sides of the water.

WILLIAM H. BROWN.

Mr. Brown was engaged in the rubber and mill supply business in Buffalo, New York, and lived at 689 West Delaware avenue in that city. He was on his way to England on a trip undertaken partly for business and partly for pleasure.

David C. Lockwood, superintendent of the Rubber & Celluloid Harness Trimming Co., of Newark, New Jersey, died at his home in that city on April 22. He was 74 years of age and had been in the employ of the Rubber & Celluloid company for more than 30 years. He was prominent in local political circles and a member of various organizations. Five daughters and a son survive him.

FIVE MEN INDICTED FOR FRAUDULENT RUBBER SHIPMENTS.

IN the March number of this publication mention was made of the discovery of an attempt on February 15 to ship rubber to the other side concealed in bales of cotton waste. The name of the shipper as it appeared on the manifest was A. B. Newman, of New York.

As may be imagined, no one was more interested in ascertaining all the facts in the case than the members of the Rubber Club, and particularly the members of the Control Committee, which had undertaken to see that the guarantee given the British Government in consideration of the lifting of the embargo was scrupulously lived up to. The committee began immediate investigations and soon discovered that the cotton bales containing the hidden rubber had come from 470 Pulaski street, Brooklyn, where a building had been recently rented by a man who represented himself as a rubber manufacturer from the West, and had assumed the name of an officer in a well-known concern in Indiana. He bought small lots of rubber in different quarters under the same disguise. These facts and many others gleaned by the committee's investigators were promptly laid before the Federal authorities.

The government has been working on this matter quietly ever since, with the result that on May 27 the Federal Grand Jury presented to Judge Pollock in the Federal Court in New York an indictment against five men for conspiracy to defraud the government through false manifests.

The defendants were Harry R. Salomon and Albert Salomon, of the firm of Salomon Brothers & Co., importers and exporters, of 299 Broadway; Albert B. Newman, importer and commission merchant of 99 Nassau street; Franz Rosenberg, of the Oestreicher-Amerikano Rubber Co., and Sigmund Karman, a rubber expert of the Excelsior Works at Budapest.

According to the assistant district attorney having the matter in charge, the method pursued was as follows: Harry Salomon, a member of the firm of Salomon Bros. & Co., who have been in business in this country for a number of years, was not an American citizen. Being in Germany at the time the war broke out, he was called to the colors as a reservist, with the rank of lieutenant. As there was a scarcity of cotton, he suggested to his superior officers the idea of coming to the United States to devise a method of getting cotton to Germany. While at work on this project he met, in Hanover, Rosenberg and Karman, who had been commissioned to sail for America to arrange, if possible, for shipment of rubber to Austria by way of Italy. Karman being a rubber expert, Rosenberg, who was equipped with a letter of credit for \$100,000 from a Vienna bank, together with Kar-

man, arrived in New York in December. Harry Salomon having arrived a little earlier. Here they were joined in the enterprise by Albert S. Salomon, the other member of Salomon Bros. A. B. Newman was working in a tailoring establishment on small wages, but being a nephew of Karman he was added to the group and set up as an export and commission merchant, with offices at 99 Nassau street.

The next step was to rent a place in Greenpoint, Brooklyn. They then bought a quantity of rubber and barrels of resin. They put the rubber in the barrels and completely surrounded it, top, bottom and all around, by a thick layer of resin, melted and poured in. They made up 276 barrels in this way, with a total weight of 142,870 pounds. These were shipped to their agent in Genoa by the Cunard liner "Carpathia," which sailed from New York on January 5, Newman filling out the manifest and swearing that the shipment contained nothing but resin. But before this resin-coated rubber reached its destination the United States government had got knowledge of the matter and had the shipment held in Naples, and in the meantime resin had been put on the list of contraband, which compelled the operators to find some other means of concealing their rubber. Their next attempt at shipping rubber was in the middle of bales of cotton waste—as described in the March number of this publication. Before doing this they had experiments made by an X-ray specialist, until they believed their cotton bales were X-ray proof.

But the government had also discovered that this plan was on foot, and consequently when 178 bales of apparent cotton waste were delivered at the White Star dock for shipment by the "Cretic" for Genoa they were immediately subjected to X-ray investigation. Several bales were passed, when the operator detected a certain cloudy effect. The bale was opened and the rubber discovered, and then the whole consignment was investigated.

It is believed that the rubber concealed in the barrels of resin and the bales of cotton amounted all told to about 50 tons, valued at about \$80,000.

The attorneys for the defendants, immediately after the indictment, gave out the following statement:

"Franz Rosenberg, a merchant of Hanover, Germany, came to this country for the purpose of purchasing rubber for certain rubber concerns in Austria. Sigmund Karman, of the rubber concerns, accompanied him for the purpose of passing on the quality of the rubber. Newman was employed by them to do odds and ends.

"In shipping the rubber in the manner they did they did so for the purpose of circumventing the enemy and had not in view a violation of any statute. They did not know that there was a statute on the books which compelled them to give a proper description in the manifest of the shipment. If they failed to comply with the law in giving an improper description in the manifest, they were entirely ignorant of such violation."

The following statement was made in behalf of the Salomon brothers, Albert and Harry:

"We have learned with great surprise and sorrow of the action of the Grand Jury. We are informed that we have been indicted for violating a highly technical statute, which, however, involves no imputation whatever of any moral wrongdoing, but merely a technical charge growing out of the present complicated international conditions. We feel ourselves entirely blameless in the matter and are not conscious of having committed any wrong whatever."

SHIPMENT OF RUBBER TO RUSSIA STOPPED.

An attempt to ship rubber by the steamship "Atlantic" to Archangel, Russia, in violation of the agreement made with the British Government, was frustrated ten days ago by the activities of the Rubber Control Committee. Upon investigation it was found that the consignment consisted of 423 cases and 100 bags of rubber. The entire cargo was later unloaded at Bush Terminal docks and the steamship "Atlantic" did not sail for Archangel as scheduled.

News of the American Rubber Trade.

THE FISK COMPANY ACQUIRES LARGE PLOT.

THE Fisk Rubber Co. has acquired what was formerly known as the Griggs property, at the corner of Oak and Grove streets, Chicopee Falls, Massachusetts. The plot consists of about 8 1/2 acres and has approximately 450 feet frontage on Oak street, 435 feet on Grove street and on the west 2,000 feet of railroad frontage. The railroad divides this property from the present plant.

Because the land originally owned by the Fisk company is now completely occupied by the recently enlarged plant, the expansion of business has made necessary the acquisition of this property. Plans have been drawn for the erection of a modern office building at the corner of Oak and Grove streets upon which work will be started at once. A warehouse and manufacturing buildings will eventually be built on the remaining land. The present offices will be used for rest rooms, restaurants, laboratory and hospital rooms.

The increased space available will make it possible for the company to provide for the welfare of its employees to a greater extent than has heretofore been possible because of lack of room, due to the rapid development of the business. The additions planned will make the Fisk Rubber Co. one of the largest institutions in New England, and its plant will be modern and well equipped in every particular.

FIVE RUBBER CONCERNS COMBINE.

The five Boston branch stores of the United States Rubber Co., namely, the Banigan Rubber Co., the Enterprise Rubber Co., the Hubmark Rubber Co., the New England Rubber Shoe Co., and the Tremont Rubber Co., are to be brought together under one roof and combined into one company known as the United States Rubber Co. of New England. These five branch stores, which have hitherto been at different places, will after the first of July all be located at 280-284 Summer street, where floor space amounting to 100,000 square feet has been secured, which will be adequate for the proper display of the various brands.

The managers of the various branch stores will still remain in charge of their different brands. C. L. Weaver will continue manager of the Banigan branch; Chester Pike, Jr., will remain manager of the Hubmark branch; Edward B. Swett will look after the American goods as heretofore, and H. C. Kalish will manage the Wales-Goodyear branch, while William H. Porter, now of the Enterprise Rubber Co., will be general manager.

The retail department of the Enterprise company will be discontinued.

The Boston office of the United States Rubber Co., Charles A. Coe eastern selling agent—will remain as it has been for years, at 140 Essex street. The American Rubber Co.'s clothing department, in charge of N. Lincoln Greene, will also continue as at present, at that location. Alterations are now in progress to accommodate the Revere Rubber Co.'s Boston office and sales room. J. H. Learned manager, which will be moved to 140 Essex street from its present Devonshire street location, on the 17th of this month. The Revere Rubber Co. manufactures the "Spring Step" rubber heel, also a general line of mechanical goods.

GOVERNMENT SUPPLIES WANTED.

Bids will be opened June 8 on 2,800 feet of air hose. Bidders interested should apply either to the Paymaster General U. S. Navy at Washington, or to the nearest Navy Pay Office, New Bedford, No. 8301. On the same date bids will be opened on 8,500 feet of single strand rubber covered wire—schedule 8345 and on 51,000 feet of single conductor wire and interior communication cable—schedules 8345 and 8347.

Schedule 8338 calls for garden and suction hose, bids on which will be accepted until June 15.

DIVIDEND PAID TO WALPOLE CREDITORS.

The creditors' committee of the Walpole Tire & Rubber Co., of Walpole, Massachusetts, made distribution May 24 of a dividend amounting to 25 per cent. of the face value of claims. At the same time a circular letter was sent out to depositing creditors referring to the sale of certain assets to and the continuance of the business of the Walpole and subsidiary companies by the Revere Rubber Co., of Chelsea, Massachusetts. Part of the purchase price has been paid by the Revere company, the balance to be paid as soon as necessary papers can be passed, inventory taken, etc. This circular letter also advises that another substantial dividend may reasonably be expected within thirty days.

That the stockholders of the Walpole Tire & Rubber Co. are not satisfied with the arrangements resulting in the purchase of this property by the creditors' committee, and the subsequent disposal of a portion of its assets—merchandise, machinery, contracts, etc.—is evidenced by the fact that a meeting was held at Boston on May 10 at which 4,300 shares of preferred stock were represented and at which a committee was appointed to investigate all of the affairs in connection with the company since its receivership and prior thereto and to report back to the stockholders.

A TEST OF DREADNAUGHT TIRES.

A novel tire test is being made by the Dreadnaught Tire & Rubber Co., of Baltimore. A Lancia car equipped with Dreadnaught tires recently started from New York for a trip to San Francisco; and as this company guarantees its tires for 7,500 miles' service, it expects the round trip to be completed on the original casings. Messrs. LaPorte and Goss, who are making the trip, are insured comfort along the route, for the interior of the car has been arranged on the Pullman idea, with berths suspended from the roof and with racks for carrying the lighter baggage. The long tail-board of the car can also be dropped outward, and a single curtain arrangement insures warmth and protection and obviates the necessity of a tent. The tires were inspected and marked by a committee at the commencement of the trip and will be re-examined at its end.

RUBBER COMPANY DIVIDENDS.

The American Chicle Co., of New York, on May 20 paid a quarterly dividend of 1 1/2 per cent. on its common stock to stockholders of record on May 15.

The Apsley Rubber Co., of Hudson, Massachusetts, has declared a semi-annual dividend of 3 1/2 per cent. on its preferred stock, payable July 1 to stockholders of record on June 22.

The B. F. Goodrich Co., of Akron, Ohio, has declared a quarterly dividend of 1 3/4 per cent. on its preferred stock, payable July 1 to stockholders of record on June 18.

The Converse Rubber Shoe Co., of Malden, Massachusetts, has declared a regular semi-annual dividend of 3 1/2 per cent., payable June 1 to stockholders of record on May 24.

CONVERSE RUBBER SHOE CO. INCREASES CAPITAL STOCK.

At the annual meeting of the Converse Rubber Shoe Co., of Malden, Massachusetts, held May 5, the old board of directors was re-elected, as well as the former officers of the company, who are: President, M. M. Converse; secretary, H. L. Dolliff; treasurer, Hugh Bullock; assistant superintendent, H. C. Arnold. At a previous meeting of the stockholders late in March, authorization was given for an increase in capital stock from \$600,000 to \$700,000, and the greater part of this issue—placed by Adams & Co., of Boston—according to late information, has already been sold.

CLIFFORD H. OAKLEY.

RAILROADING is a very good apprenticeship for any sort of active life, especially when the railroading consists of actual road construction. This means habits of hard work, attention to detail and a life in the open. All this fell to the lot of Clifford H. Oakley, between the ages of 17 and 22. It might

be mentioned in passing that Mr. Oakley was born in October, 1869, in Cleveland. At 16 he had started to work. At 17 he entered the employ of the Erie railroad as a drafting-room apprentice in the motive power department. Soon he was transferred to the maintenance of way department, as rodman, and later became an assistant engineer of the road. Mr. Oakley looks back with pleasure and satisfaction to his strenuous experiences in

the open during

those 5 years of exacting but interesting railroad work.

In 1891 Mr. Oakley entered the service of the Cleveland Rubber Co. and within a year had become assistant superintendent of that plant. When that company was consolidated with the New York Belting & Packing Co. and others to form the Mechanical Rubber Co., he was sent to Passaic, New Jersey, as superintendent of the plant of the New York Belting & Packing Co. at that place. Two years later he returned to Cleveland to become superintendent of the Cleveland Rubber Works, which position he held for 5 years. He then associated himself with the Grieb Rubber Co. at Trenton, New Jersey, as factory manager, and helped to shape the destinies of this concern for seven years, during which time he induced the Ajax Rubber Co. of New York to move to Trenton and consolidate with the Grieb company, thus forming the well-known Ajax-Grieb Rubber Co.

In 1907 Mr. Oakley decided to enter upon the manufacture of rubber goods on his own account. He founded the Essex Rubber Co., whose business, starting in a small way, has grown to its present proportions under his leadership as president and general manager. This company makes a varied line of mechanical specialties, a hard molded insulating material known as "Essex Condensite," automobile accessories, asbestos brake lining, packings, sporting goods, horseshoe pads and numerous other specialties. The company is credited with a very large production of rubber soles, and the reputation thus gained has contributed largely to its success in placing on the market the Essex rubber heel. It enjoys sales of close to a million dollars a year and has recently completed extensive additions to its plant in Trenton.

Mr. Oakley is vice-president of the Trenton Chamber of Commerce and chairman of its Manufacturing Committee, trustee and director of the New Jersey Manufacturers' Association and an active member of the American Society of Mechanical Engineers.

The accepted authority on South American rubber—"The Rubber Country of the Amazon," by Henry C. Pearson.

THE MARRIAGE OF MR. APSLEY.

Ex-Congressman L. D. Apsley, president of the Apsley Rubber Co., and Mrs. Abigail Black were married at Mr. Apsley's residence in Hudson, Massachusetts, on the evening of April 30. The ceremony was performed by the Reverend Newton Black, rector of Christ Episcopal Church, of Needham, Massachusetts, a brother-in-law of the bride.

MR. CUTLER CONTINUES HIS SCIENTIFIC RESEARCH WORK.

H. H. Cutler, vice-president of the Cutler-Hammer Clutch Co., which manufactures rubber mill devices, has moved his residence from Milwaukee, Wisconsin, where the home offices are located, to Boston, his intention being to engage in scientific research in the Massachusetts Institute of Technology, of which he is a graduate. Mr. Cutler, to whom is credited more patents on electric controlling devices than have been granted to any other person in the United States, retired several years ago from active management of the Cutler-Hammer Clutch and Manufacturing companies, both of which he founded.

PERSONAL MENTION.

Mr. Robert B. Baird, of the Rubber Trading Co., is on his way to the Pacific coast, his itinerary embracing Los Angeles, Pasadena, San Diego and the San Francisco Fair.

Word has been received that Captain Hanson, the Montreal manager of the Dunlop Tire & Rubber Goods Co., Limited, and formerly connected with the Canadian Consolidated Rubber Co., Limited, who went to the front with the Canadian troops some months ago, has been wounded in battle.

Mr. and Mrs. Wilmer Dunbar—the former vice-president and general manager of the Dreadnaught Tire & Rubber Co., of Baltimore, and of the Greensburg Tire & Rubber Co., of Greensburg, Pennsylvania—on May 14 celebrated the twenty-fifth anniversary of their marriage with a dinner to their friends at the Greensburg Country Club.

H. T. Dunn, president of the Fisk Rubber Co., of Chicopee Falls, Massachusetts, has acquired an interest in the Willys-Overland automobile manufacturing company and will in the future devote a portion of his time to the interests of that company, being its vice-president and a member of its board of directors. The Willys-Overland plant is located at Toledo, Ohio.

C. W. Wacker has been promoted from the management of The B. F. Goodrich Co.'s branch at Toledo to a similar position at Cleveland, Ohio, being succeeded in the former city by H. W. L. Kidder.

The Republic Rubber Co., of Youngstown, Ohio, is being represented in Utah by Rudolph Orlob, with offices in the Walker Bank building, Salt Lake City.

W. O. Durrell, formerly connected with the Diamond Rubber Co., has been appointed Boston branch manager for the Pennsylvania Rubber Co., of Jeannette, Pennsylvania, succeeding Graham Laurie, who will devote his attention hereafter to an accessory concern in which he has purchased an interest.

J. S. Watterson, formerly manager of the Iroquois Rubber Co., of Buffalo, New York, has become president of that concern, an office made vacant by the resignation of Edward T. Smith to assume the presidency of the Chicago Rubber Co., of Chicago, Illinois.

James Pfeiffer, president of the Miller Rubber Co., of Akron, arrived in New York from Bermuda, May 19, on the "Bermudian" of the Quebec line.

R. E. Smith, formerly Providence branch manager for the United States Tire Co., has been appointed manager of the branch at Worcester, Massachusetts, succeeding John R. Whitmyer.

C. F. McPHILLIPS & CO. OPEN CRUDE RUBBER OFFICE.

A new firm, in which C. F. McPhillips is president, and known as C. F. McPhillips & Co., Inc., has been established at 17 Water street, New York, to deal in crude rubber. Mr. McPhillips has had long experience in the rubber trade, in proving qualities, grading and making selections of the various rubber stocks. He was connected for eight years with Earle Brothers, until his resignation in April 1 to establish this new enterprise, and for two years previous with Wallace L. Gough.

AJAX-GRIEB WINS INFRINGEMENT SUIT.

The Ajax Grieb Rubber Co., of Trenton, New Jersey, has successfully defended the suit brought against it by the Goodyear Tire & Rubber Co., of Akron, Ohio, for infringement of patent on a collapsible tire core, decision having been rendered in favor of the former company. The patent on which infringement was claimed was one issued in 1907 to Will. C. State and assigned by him to the Goodyear company, but evidence, in the form of drawings and testimony, brought out the fact that collapsible cores, built by The John E. Thropp's Sons Co., had been in use by the defendant company as early as 1903.

THE AKRON TIRE CO. MANUFACTURING IN LONG ISLAND CITY.

The Akron Tire Co., Inc., formed in 1911 with a capital stock of \$5,000 to manufacture rubber goods, has increased its capitalization to \$300,000, and has gone into the manufacture of rubber tires in a \$135,000 factory at Long Island City, New York, completed early in 1914, and which has a capacity of about 200 tires per day. These tires are made under the brand "Akron," and are distributed under a guarantee of 3,500 miles' service. The company's main offices and distributing headquarters are at 1612 Broadway, New York.

NEW WATERPROOFING PROCESS.

A new method of waterproofing textiles is based on the impregnation of their constituent parts. The weft threads are wound and placed in autoclaves filled with a rubber solution. Pressure is applied to obtain perfect impregnation. Weaving is done while the solution is still in a liquid form on the threads. The working of the loom forces out the liquid, which is distributed over the warp threads by friction. With proper density of the solution and the proper division of the fabric into warp and weft, complete impregnation can be obtained, the finished fabric being perfectly waterproof without preventing the circulation of air.

Wooden fabrics so treated can be dressed and finished in the ordinary manner. This method applied to tire fabrics is said to increase their resistance to friction.

RUBBER IN A REAL LIFE ROMANCE.

An interesting story has appeared in the daily press in which Frederick A. Chubb, president of the United States and Central American Timber, Rubber & Realty Co., is the central figure. It relates how Mr. Chubb, while living in Washington in 1900 with his wife and one child, was suddenly called to arms, being sent to China where in an encounter at Peking he was severely wounded and for several months confined to a hospital. A telegram reached his wife, whom in the meantime a second child had been born—that he had been shot, naturally led her to believe him dead, so that on his return to the United States he learned that she had remarried and left Washington with her children. After several months spent in a fruitless search for his family, he secured work in the Panama Canal zone, where he invested his savings in rubber and timber lands, until finally he owned 100,000 acres. On a business trip to the United States recently he learned through relatives of his wife's death at Hagerstown, Maryland, and on a visit to that town he discovered his two children, the oldest a son and a daughter, was working in a factory. He has since been reunited with his family in his Southern home.

TRADE NEWS NOTES.

The Hood Rubber Co. is building a warehouse on its property at Watertown, Massachusetts. This new building will contain 79,000 square feet of floor space, being 176 feet long, 112 feet wide and 4 stories high.

The Boston Woven Hose & Rubber Co., of Boston, announces the addition to its selling force of Louis O. Duclos, former sales manager for the Walpole Tire & Rubber Co., of Walpole, Massachusetts. Mr. Duclos, who has a wide acquaintance in the trade and a thorough knowledge of the market, will act as special representative, handling friction and insulating tapes and splicing compounds.

The National India Rubber Co., of Bristol, Rhode Island, and the Safety Insulated Wire & Cable Co., of New York, have been awarded contracts to furnish cable of different grades for use in the underground construction of the police and fire alarm installations at Niagara Falls, New York.

The International Association of rubber stamp makers will hold its 1915 annual convention at the Multnomah Hotel, Portland, Oregon, July 14-16. Special railroad rates have been obtained for eastern members who may wish to attend, and plans prepared for interesting sightseeing trips.

The Southern Rubber & Supply Co. has secured the agency for Goodrich tires in Atlanta, Georgia, and has opened a store in that city at 84 North Pryor street.

The Globe Tire Co., of Trenton, New Jersey, has made arrangements with the Hartford Garage Co., of Hartford, Connecticut, for the distribution of its tires in that city and state.

The Airplex Inner Tire Co., of Springfield, Missouri, incorporated in June, 1914, with a capital stock of \$3,000, to deal in and manufacture articles of rubber and rubber substitutes, has increased its capitalization to \$20,000.

The Fisk Rubber Co., of Chicopee Falls, Massachusetts, has opened a branch at Columbia, South Carolina, in charge of J. P. Leavitt, where a large stock of tires and accessories will be carried for distribution throughout that state and surrounding territory.

One of the conspicuous features of the recent Chicago Prosperity Parade was the section occupied by the Firestone Tire & Rubber Co. This company had a large touring car, a truck and seven small service cars in the line, elaborately decorated and particularly calling attention to Firestone tire service, to prove the superiority of which the track victories in which these tires have figured were well emphasized.

A process has been invented for the electrical treatment of cloth by which it is rendered impervious to water while being permeable by air, and which is expected to prove of value in the manufacture of dirigible balloons, the addition of weight due to this treatment being very slight, or less than 1 per cent.

The John A. Roebbling's Sons Co. of New York, a branch of the John A. Roebbling's Sons Co., of Trenton, which manufactures rubber insulated and other wires, has become a member of the Merchants' Association of New York.

M. I. Goldberg, formerly secretary and treasurer of the Manchester Rubber Co., a concern formed in 1912 to manufacture rubber clothing, with headquarters at 79 Hope street, Brooklyn, New York, announces that he has severed his connection with that company.

Fifty years' continuous employment with one concern is a distinction of sufficient rarity to command attention, and as a rule reflects favorably on the conditions surrounding such employment. On April 16 Miss Rose A. Gray completed fifty years of employment in the rubber factory of Eberhard Faber at Newark, New Jersey, which she entered when 15 years of age. The occasion was marked by the presentation of a purse of gold, floral tributes and other appreciative demonstrations.

WITH THE GOODYEAR RUBBER COMPANY FIFTY YEARS.

There are not many men in the rubber trade, or as a matter of fact in any trade, who have the satisfaction of rounding out a full 50 years of association with one company, but this is the distinction that has been achieved by James Suydam, treasurer and general manager of the Goodyear Rubber Co., of St. Paul.

It was in 1865 that Mr. Suydam first entered the employ of the Goodyear company in New York City, then known as the Rubber Clothing Co. He began as a bookkeeper but was soon promoted to the selling department. He was given the western territory, making his headquarters in Chicago. He was the first rubber salesman to visit the Twin Cities—St. Paul and Minneapolis—going there in 1867, when the combined population of the two places was only 50,000. In 1875 he was made manager of the Milwaukee branch, remaining there 10 years. He went to St. Paul in 1885 and opened northwestern branches for the company in that city and in Minneapolis. During the last 2 years he has also had charge of the Milwaukee branch.

Mr. Suydam says that he is 73 years old, but this statement rests purely on his own word as there are no physical proofs to substantiate it. He looks like a man of 60 and is as full of energy and business capacity as most men of 50.

PERSONAL MENTION.

Albert Waterhouse, president of The Waterhouse Co., Limited, Honolulu, and secretary of the Pahang Rubber Co., Limited, and also of the Tandjong Olok Rubber Co., Limited, of the Malay Peninsula, made a recent call at the office of THE INDIA RUBBER WORLD, together with M. A. Cheek, the manager of the Waterhouse interests on the east coast of the Malay Peninsula. Messrs. Waterhouse and Cheek are on their way from the East to the company's headquarters in Honolulu.

Arthur E. Friswell, who formerly was associated with a number of tire companies, including the Mechanical Fabric Co., The Hartford Rubber Works Co. and the Goodyear Tire & Rubber Co., in the capacity of tire superintendent, but who has been spending the last few years in Bermuda, has returned to the United States and expects to engage again in tire manufacture.

Dr. J. W. Rabe, physician of The B. F. Goodrich Co., as well as chief of the city hospital staff, of Akron, Ohio, visited New York, May 22, as representative of the company at a conference of physicians of 25 of the big factories of the United States. This is the first conference of its kind ever held here, its purpose being the exchange of information and suggestion on factory medical work.

Otis R. Cook, sales manager of the Kelly-Springfield Tire Co., of Akron, has been elected a director of that company.

The Boston Woven Hose & Rubber Co. is represented in Missouri by J. W. Culver, with offices at Fifth and Olive streets,



JAMES SUYDAM.

St. Louis, in the Syndicate Trust building. Mr. Culver is described by a local newspaper man as one "who knows how to specialize, systematize and concentrate business methods."

J. W. Davidson, whose death occurred on April 11, had been employed for the past ten years in the Montreal office of the Canadian Consolidated Rubber Co., Limited, as an artist and designer, the thousands of molds used by that company being largely the result of his work.

MR. HERMESSEN ON HIS WAY TO JOIN THE ENGLISH ARMY.

A recent visitor to New York, and also to the office of THE INDIA RUBBER WORLD, was J. L. Hermessen, F. R. G. S. Mr. Hermessen, who is a civil engineer, left England fourteen years ago for this side of the water. He spent about a year in the States and then went to Mexico, where he became very much interested in the development of rubber plantations, although his work properly had to do with railroad construction in that republic. He was intimately acquainted with the late J. C. Harvey and spent some time on his plantation at La Buena Ventura and became deeply interested in Mr. Harvey's experiments both in *Castilloa* and later in *Hevea*. When Mexican conditions became such that no Anglo-Saxon could remain there with comfort or safety, Mr. Hermessen went to Ecuador, where during the last year and a half he has been engaged in railroad surveys. It was his intention to go from there into the rubber country of the Amazon, but the outbreak of hostilities changed his plans and decided him to return to England. He sailed from New York on the "Adriatic" May 27 and intends on reaching England to offer his services as an engineer to the military authorities.

TRADE NEWS NOTES.

The New Jersey Zinc Co., from its offices at 55 Wall street, New York, gives out a statement to the effect that it has no intention of operating a rubber tire plant in connection with its factories at Palmerton and Millport as has been reported in the daily press.

On page 404 of our April issue mention was made of the purchase by The Midvale Steel & Iron Co. of equipment for a reclaiming mill to be established near Youngstown, Ohio. This was incorrect, the purchase referred to having been made by The New Castle Steel & Iron Co., of New Castle, Pennsylvania.

The Michelin Tire Co., of Milltown, New Jersey, through its central representative, R. B. Tracy, at Chicago, has established an agency with Brant Brothers, of Indianapolis, for the sale of its product in that section. F. J. Potter has been placed in charge of the company's new branch in Des Moines, Iowa.

As a result of tests recently made, the official league baseball made by The Draper-Maynard Co., of Plymouth, New Hampshire, has been adopted for use in the public schools of New York City during the 1915 season. The rubber center and the thread were both included in these tests and the ball was used for some time in actual play.

Work has been started on a three-story factory addition to the plant of the St. Mungo Manufacturing Co. of America, at Newark, New Jersey. This building, which will be devoted to the manufacture of golf balls, will occupy a space 50 x 75 feet and will cost in the neighborhood of \$15,000.

The 200-mile Southwest Sweepstake automobile race at Oklahoma City on April 29 was won by "Bob" Burman, who drove a French Peugeot car, fitted with Nassau tires, made by the Thermoid Rubber Co., of Trenton, New Jersey. His average speed was 67.98 miles per hour.

In a late Balson report on business conditions, issued for distribution to manufacturers and jobbers, Akron is described as a city which stands out from the rest and one which should not be overlooked by salesmen. The report says that Akron rubber mills "are paying unusually low prices for their crude rubber and hence, with good orders on their books, are in an exceedingly favorable position."

TRADE NEWS NOTES.

The firm of Johnstone, Whitworth & Co., which imports and deals in crude rubber, on May 1 changed its name to J. T. Johnstone & Co., and its address from 130-132 Pearl street to 22 William street, New York.

Fred Stern & Co., crude rubber brokers, with offices in London and Liverpool, announce the opening of a New York branch in the South Ferry building, 44 Whitehall street.

The explosion of a vulcanizing machine did considerable damage recently to the building, stock equipment of the Todd Rubber Co., which conducts a service and supply station at Norwich, Connecticut. The failure of the safety steam pressure valve to work is given as the presumable cause of the explosion.

The L. E. Bowers Co., of 326 North Broad street, Philadelphia, has been appointed exclusive selling agent in that city for the Miller tire, made by the Miller Rubber Co., of Akron, Ohio.

At the 18th annual meeting of the American Society for Testing Materials, to be held at the Hotel Traymore, Atlantic City, New Jersey, June 22-26, committee D-9, of which C. E. Skinner is chairman, will report on Standard Tests of Insulating Materials.

The Converse Rubber Shoe Co., of Malden, Massachusetts, has brought suit in the Superior Civil Court at East Cambridge against the Boston & Maine Railroad for \$300,000 fire damage which it alleges resulted from a spark dropped from one of the railroad company's locomotives.

An order recently received by the Republic Rubber Co., of Youngstown, Ohio, for solid rubber tires for export, was duplicated a few days later with the result that this department will be more than usually busy for some months to come. The garden hose department is also reported to be fully occupied, the output for April being 300 per cent. greater than that of any previous month.

This company has opened a factory sales branch, under the management of Glen P. Thayer, at 44 North Division street, Grand Rapids, Michigan, to serve the trade of western Michigan.

The Mansfield Tire & Rubber Co. will shortly begin the erection of a four story and basement addition to its plant at Mansfield, Ohio, this new structure to be 100 x 41 feet.

Work is being rushed on the plant of the Marathon Tire & Rubber Co. at Cuyahoga Falls, Ohio, which it is hoped to have ready for occupancy by the middle of July. The building when completed will be 300 x 196 feet, four stories high, with basement, and will cost in the neighborhood of \$100,000. It is being erected in three sections, two of which are well under way.

The Biggs Boiler Works Co., of Akron, Ohio, which manufactures vulcanizers, devulcanizers, tire repair equipment, etc., is increasing its capacity by the erection of a one-story brick factory addition 30 x 150 feet.

The Gordon Rubber Co., of Canton, Ohio, has just completed a factory addition 28 x 110 feet, and has two small buildings now in course of construction, to be used for tire and sundries departments.

The East Palestine Rubber Co., of East Palestine, Ohio, is putting an additional story on its factory, which will enable the company to triple its present capacity in tires and tubes. H. L. Larsen, formerly with the Boston Woven Hose & Rubber Co., of Cambridge, Massachusetts, and more recently with the Federal Rubber Manufacturing Co., of Milwaukee, Wisconsin, is the superintendent.

The Adamson Machine Co., Akron, Ohio, has added a new building, 80x100 feet, in which it has commenced the manufacture of converted steel castings of very high grade, ranging from 1 to 5,000 pounds, for making steel molds. A new administration building, which will house the offices and drafting departments, is also under construction.

THE NAVY DEPARTMENT AWARDS BALLOON CONTRACT.

Contract was awarded to the Connecticut Air Craft Co., of New Haven, Connecticut, May 14, by Secretary Daniels, for a dirigible balloon for the United States Navy, on a bid of \$45,636.25. Of the four bids submitted, the Connecticut company was the only one accompanied by complete data and specifications. The contract calls for delivery within four months. This dirigible is designed to carry 8 men. It is to be 175 feet long and 55 feet high, and will have a gas capacity of 110,000 cubic feet. The construction of the gas bag will require thousands of yards of rubber coated silk. The last naval appropriation bill carried a specific appropriation of \$1,000,000 for aeronautics.

TRADE OPPORTUNITIES FROM CONSULAR REPORTS.

A Russian business man requests the names of American firms desiring to purchase old rubber. Report No. 16,689.

A manufacturer of photographic materials in France wishes to be put in touch with manufacturers of sponge rubber, to conform to samples which may be examined at the Bureau and its branch offices. Report No. 16,768.

THE MOHAWK RUBBER CO. ESTABLISHES AGENCIES.

The Mohawk Rubber Co., of Akron, Ohio, which manufactures tires and tubes under the trade name "Quality," has recently given distributing agencies to the following concerns: Scanlon Auto Tire & Supply Co., Rochester, New York; Utica Cycle Co., Utica, New York; W. J. Holliday Co., Indianapolis, Indiana; Erie Supply Co., Toledo, Ohio, and The Southern Motors Co., Louisville, Kentucky.

GOODYEAR TIRE & RUBBER CO. CLOSES ITS NEW YORK RETAIL STORE.

The Goodyear Tire & Rubber Co., of Akron, Ohio, has discontinued its retail department in New York City and will distribute its product in that section hereafter through its service station and truck tire department at 207 West Fiftieth street, and its mechanical goods branch at 30 Church street, both of which are in charge of P. E. Smith, branch manager, under the general supervision of J. W. Hobbs, New York district manager. The district office and warehouse are located at 588 Jackson avenue, Long Island City.

RUBBER COMPANY TO LOCATE AT KEOKUK.

The Standard Four Tire Co. has been organized, along co-operative lines, to manufacture automobile tires, specializing in four standard sizes, 30 x 3, 30 x 3 1/2, 32 x 3 1/2, and 34 x 4 inch. Offices have been established at Keokuk, Iowa, where the erection of a factory is to be started not later than July 15, arrangements having been effected with the local industrial association by which a three-acre site has been secured for this purpose. It is also required that \$20,000 worth of 8 per cent. preferred stock be subscribed locally, work to start when total subscriptions reach \$49,000. The company's capitalization is \$200,000, and its officers are: President, J. R. Beaver; treasurer, F. M. Sweetser; secretary, A. L. Higbee, all of Marion, Indiana. The enterprise has been promoted by I. V. Maclean, of Toledo, Ohio. The plans provide for the erection of a one-story brick and steel building, not less than 200 x 60 feet, to be completed by October 15, and the employment of 40 operatives at the start.

As a protection against the gases employed in the bombs with which Germany is now waging warfare, the German soldiers are provided with rubber respirators, such as are commonly used by chemical workers in the factories of that country. These respirators are snout-shaped and a moistened plug neutralizes the effects of the gas, while a valve at the side provides for exhalations. In other instances their outfits have included a small bag containing a pad to be placed over the mouth when charging over gas-swept areas.

NEW INCORPORATIONS

American Rubber Corporation, April 21, 1915; under the laws of Delaware; authorized capital, \$300,000. Incorporators: H. H. Waller, 78 Essex street; Henry C. Botty, Jr., 140 Nassau street both in New York City and M. Friedberg, 1460 Union street, Brooklyn, New York. Principal office, with the Capital Trust Co., Dover, Delaware. To manufacture, buy, sell, import, export and otherwise deal in rubber and all articles made wholly or partly of rubber.

Athletic Rubber Bag Corporation, May 13, 1915; under the laws of New York; authorized capital, \$5,000. Incorporators: Pauline Scolnick and Israel Scolnick—both of 121 Canal street—and Morris Hochstein, 19 Henry street—all in New York City. To manufacture rubber and leather bags, etc.

Bona Vida Co., Inc., May 19, 1915; under the laws of New York; authorized capital, \$10,000. Incorporators: Joseph D. Jennings, Rutherford, New Jersey; Miriam Weinberg 232 Howard street, and Louis H. Harris, 445 West One Hundred and Twelfth street—both in New York City. To manufacture sanitary rubber goods.

Ceylon Tire Co., April 14, 1915; under the laws of Ohio; authorized capital, \$10,000. Incorporators: H. W. Holcombe, E. R. Purviance, C. C. Stoffer, O. A. Cherry, and William F. Kelley. To buy, sell and deal in automobile tires and automobile accessories.

Cleveland-Ford Tire Co., April 23, 1915; under the laws of Ohio; authorized capital, \$10,000. Incorporators: R. E. Elvidge, E. R. Cook, C. G. Roads, M. A. McManus, and L. B. Bacon. To manufacture buy, sell and deal in automobile tires and tubes.

Cornfield Resilient Wheel Co., April 3, 1915; under the laws of New York; authorized capital, \$400,000. Incorporators: Stanislaw Verusio, William H. Byrne—both of 25 Broad street—and Noah Cornfield, Hotel Apthorp, Ninety-fourth street and Broadway—all in New York City. To manufacture tires and wheels, etc.

Covey Trading Corporation, May 6, 1915; under the laws of New York; authorized capital, \$25,000. Incorporators: A. G. Levy, Scarsdale, New York; Allan E. Cohn, 683 Fifth avenue, New York City, and Daniel G. Griffin, 129 Pierrepont street, Brooklyn, New York. Commission dealers in textiles, metal, rubber, etc.

Double Tread Tire Co., April 27, 1915; under the laws of Illinois; authorized capital, \$4,000. Incorporators: Albert C. Unban, Charles H. Wood and B. W. Schumacher. Principal office, 1438 South Michigan avenue, Chicago. To manufacture, repair and rebuild automobile tires, and buy, sell, exchange and deal in automobile tires, etc.

Eagle Waterproof Co., Inc., The, April 23, 1915; under the laws of New York; authorized capital, \$10,000. Incorporators: Sophia Rosken, 295 South Second street; Simon Harris, 87 New Grand street, and William Salinger, 1726 Union street—all in Brooklyn, New York. To manufacture rubber clothing, etc.

Kirk Tire & Supply Co., The A. W., April 13, 1915, under the laws of Ohio; authorized capital, \$10,000. Incorporators: A. W. Kirk, John E. Parsons, Jr., W. O. Guiss, H. W. Fraser, and J. B. Clark. To manufacture, buy, sell and deal in automobile tires, supplies, etc.

Kohl Manufacturing Co., April 20, 1915; under the laws of Massachusetts; authorized capital, \$10,000. Incorporators: Fred E. Sanders, 125 Marlboro street; Frank H. Cole, 37 Webster avenue; Clinton E. Somes and Ralph B. Currier, both of 12 Bloomingdale street—all in Chelsea, Massachusetts. To deal in and manufacture all kinds of asbestos and rubber goods, or merchandise of which asbestos or rubber is a part.

McPhillips & Co., Inc., C. F., April 29, 1915; under the laws of New York; authorized capital, \$10,000. Incorporators: Cornelius F. McPhillips, West Orange; Alexander H. Barklie,

167 Newkirk street, Jersey City both in New Jersey and Fred E. Henning, 10 Wall street, New York. Commission dealers in crude rubber.

Midgley Tires Co., The, March 31, 1915; under the laws of Ohio; authorized capital, \$5,000. Incorporators: Thomas Midgley, Thomas Midgley, Jr., Henry Plow, Charles S. M. Krumm, and Panel J. Cull. To buy, sell and deal in tires and other automobile accessories.

Milwaukee Auto Tire Exchange, March 24, 1915; under the laws of Wisconsin, authorized capital, \$10,000. Incorporators: S. E. Schroeder (president), 461 Milwaukee street, and W. N. Durbin (secretary and treasurer), 3328 cedar street—both in Milwaukee, Wisconsin. Principal office, Milwaukee. To deal in auto tires.

Mystery Tire Co. of Canada, Limited, March 4, 1915; under the laws of Canada; authorized capital, \$400,000, divided into 4,000 shares of \$100 each. Principal place of business, Montreal, Canada. To manufacture automobiles, cycles, airships, carriages and conveyances of all kinds and articles used in the construction thereof or articles made of wood, iron, rubber, etc. Incorporators: Henry and Elmer Farmer, Elie Laumière, Berthe Dufort, and Jeanne Marsan—all of Montreal.

Obalski & Sweeney, Inc., May 17, 1915; under the laws of New York; authorized capital, \$100,000. Incorporators: Xavier W. Obalski and Edward C. Sweeney, Jr.—both of 59 Pearl street—and Wendell P. McKown, 50 Church street—all in New York City. To deal in rubber and rubber products.

Pneumatic Spring Equipment Co., Inc., May 7, 1915; under the laws of New York; authorized capital, \$50,000. Incorporators: John L. Wehrmann, 450 East One Hundred and Seventy-sixth street; Clinton J. Beasley, 1750 Anthony avenue—both in New York City—and Henry Seibel, 333 Thirteenth street, West New York, New Jersey. To manufacture pneumatic springs, tubes, tires, auto. parts, etc.

Folack Tyre & Rubber Co. of New Jersey, April 21, 1915; under the laws of New Jersey; authorized capital, \$5,000. Incorporators: Hugo Hoffstaedter and John F. Crowley—both of 246 West Fifty-ninth street, New York City—and Edward Weber, 51 Stanton street, Newark, New Jersey. Principal office, 51 Stanton street, Newark. To manufacture, sell and deal in tires, rims, automobiles etc.

Qualityre Rubber Co., March 1, 1915; under the laws of Maine; authorized capital, \$100,000. Clement Studebaker, Jr. (president), South Bend, Indiana, and Scott Brown (secretary), Lytton Building, Chicago. To engage in a general mercantile and rubber business.

South West Qualityre Co., May 3, 1915; under the laws of Maine; authorized capital, \$100,000. Incorporators: A. B. Farnham, Clarence G. Trott, J. P. O'Donnell, J. R. Griffin, and Charles W. Hamilton all of Portland, Maine. To deal in rubber and rubber goods.

Tayson Rubber Co., The, April 27, 1915; under the laws of Rhode Island; authorized capital, \$200,000. \$100,000 common and \$100,000 preferred. Incorporators: Alfred G. Chaffee, John A. Tillinghast—both of Providence—and Teresa E. Muller, Cranston all in Rhode Island.

Tilt Shoe Co., J. E., April 29, 1915; under the laws of Illinois; authorized capital, \$500,000. Incorporators: J. E. Tilt, Otto S. Schmidt, David Tilt, F. R. Lamb and S. A. Corlett. Principal office, 512-522 West Huron street, Chicago, Illinois. To manufacture and deal in shoes and rubbers.

According to a late consular report, there is a good market in India for rubber combs, large quantities of which in the past have been supplied by Austrian and German firms. The native women are said to use the same type of comb as that in use by Europeans and Americans, while the Parsi women often use a number of combs for decorating and ornamenting their hair.

TRADE NEWS NOTES.

The Turner, Vaughn & Taylor Co., of Cuyahoga Falls, Ohio, has just turned out a large number of 150-ton presses for solid tire work.

The Firestone Tire & Rubber Co., of Akron, Ohio, is adding a second story to the building at Wood and Broad streets, Philadelphia, which is being occupied by its branch in that city as a solid tire shop.

The Xenia Rubber Manufacturing Co., of Xenia, Ohio, has increased its manufacturing facilities as well as its lines of production by the purchase of the entire assets of the Springfield Tire & Rubber Co. and the Springfield Elastic Tread Co., both of Springfield, Ohio. The equipment included in this purchase is to be moved into a new factory at Xenia.

The People's Rubber Co. has decided upon the removal of its plant from Akron to Barberton, Ohio, where it will occupy the old factory of the Summit Rubber Co., employing at the start about 100 men.

The Victor Rubber Co., of Springfield, Ohio, which recently completed an addition to its plant, is soon to commence work on another building, 30 x 108 feet. A mileage capacity test is now being made of the new pneumatic tire made by this concern. An automobile has been equipped with a set of these tires and will be run 300 miles a day while they last.

The Gordon Rubber Co., of Canton, Ohio, is considering the increase of its capital stock from \$300,000 to \$600,000, the proceeds of the new issue being intended to provide funds for needed additions.

The Lavelle Rubber Co., which deals extensively in hose, packing, mechanical rubber goods and mill supplies throughout the Middle West, with headquarters at Chicago, has moved from 231 North Fifth avenue, where it has been so long located, to 181 West Lake street.

The McNaul Auto Tire Co., of Toledo, Ohio, is represented in New England by branches at Hartford, Connecticut and Providence, Rhode Island, in charge, respectively, of A. A. Tuttle and James C. O'Donnald.

At a recent meeting of stockholders of the Kelly-Springfield Tire Co., held at Jersey City, a resolution was passed authorizing the establishment of a fund—to the amount of 10 per cent. of the yearly net profits in excess of \$1,000,000—to be distributed among officers and employees of the company, according to a plan not yet decided upon.

An involuntary petition in bankruptcy was filed May 3 against the Mercury Rubber Co., of Brooklyn, New York. This company, composed of Samuel and Morris Honeyman, George Broches and Michael Mislig, was engaged in the rubberizing of cloth, at 147 Forty-first street, Brooklyn.

The Motor Tire Re-Construction Co., incorporated in March, as mentioned on page 439 of our May issue, has moved its New York office to 52 Vanderbilt avenue, and secured temporary manufacturing accommodations at Mt. Vernon, New York.

A company has been formed in Brooklyn, New York, to carry on a general tire sale and repair business, known as the Double-Life Tire Co., Inc. This company claims a process on which patent is pending for converting two worn tires into one "strong, durable shoe." Prices are quoted when customer furnishes both casings or only one.

The National Rubber Manufacturing Co., of Long Island City, New York, has leased a factory at Harrison, New Jersey, to be operated as a rubber plant, with rubber horseshoe pads as a specialty.

The San Francisco branch of the United States Rubber Co. is reported to have recently brought about the arrest of Russell K. Smith, a dealer in automobile accessories, who, before the grand jury, confessed to having influenced Harry L. Rogers, also of San Francisco, to steal automobile tires to the value of \$10,000 from the United States company, where he was em-

ployed. The system was a simple one, orders placed by Swift for a pair of tires being filled with probably five or six tires and billed at the price ordered.

The Savage Tire Co., of San Diego, California, has received authorization from the State Corporation Department to issue and sell bonds to the amount of \$500,000. These bonds, which are to run from ten to twenty years, are to be marketed at a price that will net the company 90 per cent. of face value. The proceeds are understood to be intended for the payment of outstanding obligations on the present plant and equipment, for the construction of additions and the development of patents and business.

The sales convention of the Goodyear Tire & Rubber Co. will be held this year at San Francisco instead of at the Akron factory.

The United States Tire Co. has established a distributing branch at Erie, Pennsylvania, with store and warerooms at 29 West Eleventh street, from which salesmen will be sent out over the surrounding territory.

The secret of the noiseless street car, the invention of which has recently been announced, is a perfected type of running gear, duplex wheels, one revolving within the other and separated by thick bands of rubber, supporting the trucks.

WHERE RUBBER-ITE HOSE AND BELTING ARE MADE.

Here is a photographic view, in condensed form, of the factory where "Rubber-ite" cotton hose and "Rubber-ite" belting are made. It is the plant of the McIlroy Belting & Hose Co., Hammond, Indiana, which was founded by F. B. McIlroy.

Mr. McIlroy has had over thirty years' experience in the manufacture of fire hose, and he naturally has confidence in his ability as a hose maker. He believes that his Rubber-ite cotton rubber-lined fire hose cannot be surpassed. It is made of carefully selected cotton yarn and the lining is the highest grade Para rubber, but its distinguishing feature lies in the fact that the cotton is impregnated with a compound made from elaterite, which is a hydrocarbon sometimes called Mineral Rubber and which is reduced to a fluid form by a special process invented by the McIlroy company. Because of this elaterite impregnation the company feels warranted in stating that the hose is permanently pre-



PLANT OF THE MCILROY BELTING & HOSE CO.

served from mildew and decay, that it will not absorb water and thus become heavy and burdensome, that it is protected from chafing and that it is impervious to oils, which therefore cannot penetrate the cotton and destroy the rubber.

The same claims are made for the company's belting, which is folded and sewed in the same manner as all stitched canvas belting, but in which the cotton is thoroughly impregnated with elaterite, which acts as a filler and has the same preserving effect as described above in the hose.

Rubber-ite hose and belting have been on the market for ten years and have been highly praised by a great many people who have given them the most thorough test in actual use.

THE RUBBER TRADE IN BOSTON.

By Our Regular Correspondent.

BUSINESS in the rubber industry is unevenly divided. In spite of the fact that this is a pretty good year for automobiling, taking the number of machines in actual use, there are tire people who complain of slow business, while others report running well up to capacity. No doubt the number of manufacturers now making tires must result in the splitting up of the business, but it is a very noticeable feature that those doing extensive advertising report better business than some of the lesser known producers.

The makers of first class clothing report that the manufacturers of cheap lines cut into their business on the lower priced goods, but that in the finer lines business is good. Up to now the expected difficulty of securing foreign textiles has not materialized to any great extent, while some American cloths are being made which fully equal the imported article. In mechanicals at least one leading factory has a sufficient demand to run night shifts to get out its orders. Drug sundries are in nominal, seasonable demand. Boot and shoe orders are coming in steadily and factories running well up to normal output, either on orders or in anticipation of later business. Tennis shoes are having an extraordinary call, and the manufacturers are vying with each other to bring out more stylish lines.

Crude rubber dealers and brokers report a very slowly yet noticeably increasing demand. Consumers have been, and still are, buying in smaller quantities than in previous years, but, as was said before, business is improving somewhat in this particular. Reclaimers are not specially happy just now. Scrap rubber is high and reclaimed rubber selling at much lower prices than formerly. There are no foreign galoshes coming here. Russia and Germany are holding all for domestic reclaiming. This makes scrap shoes high, while old tires, which yield much greater proportion of reclaimed gum, and usually are higher than shoes, are now quoted at much lower prices.

The Boston Woven Hose & Rubber Co. was the host, and 90 members of the Boston chamber of commerce were the guests at an interesting function which took place Thursday, May 6. There was recently inaugurated by the chamber a series of "Industrial Excursions," visits to manufacturing plants in the vicinity of Boston, and this was the ninth of the series.

The members were conducted in special cars to the factory at Cambridge, where they were welcomed by Vice-President George E. Hall and Treasurer Henry B. Sprague. Mr. Hall made a brief address and then the party was split up into eleven groups, each of which, in charge of a guide, was conducted through the various departments of the plant.

The trip began at the basement, where the visitors were shown the bins of crude rubber, then conducted through the mill-room, where the processes of washing, mixing and calendaring were explained; thence through various other departments, where the visitors saw the many processes for manufacturing tubing, jar rings, heels and soles, belting, hose, etc. Special admiration was shown regarding the exhibit of hose weaving machines, and the manufacture of hose of all sizes from half inch garden hose to great suction and fire hose, while the production of belting called for similar expressions of interest.

From the rubber departments to the brass foundry and finishing shop the groups were conducted, and here they were shown the manufacture of nozzles, couplings, sprinklers and similar articles.

As souvenirs of the occasion, each visitor received a package of fruit-jar rings, a box of tire tape and a book of preserving recipes. One of the officials of the chamber of commerce characterized the excursion as one of the most instructive and interesting of the trips the chamber has taken this season, and,

practically without exception, the various members of the party manifested unusual interest and expressed great surprise at the extent to which the plant of this company has grown.

It is reported that the Boston Woven Hose & Rubber Co. handled the largest business in its history during the last three months, and that all the departments except those where women are employed have been running night shifts to keep abreast of their orders. This is mostly domestic business, though the effects of the war have been noted by orders being received from parties in South America and Africa which would have gone to England under pacific circumstances.

The Apsley Rubber Co., of Hudson, Massachusetts, in celebrating the thirtieth anniversary of its foundation, has issued a handsome catalog of the clothing and footwear which it manufactures. The picture of its first factory, started in 1885—a two-story, rented building—is strongly contrasted with the great industrial plant of today, with its big brick buildings, its complement of machinery, propelled by electric power brought from the Connecticut river, many miles away; its rows of houses for the work people, special railroad side tracks and all the appurtenances of a great manufacturing plant. Hon. J. D. Apsley may well be proud of the industry he has founded, and the success it has achieved. A short "Foreword," written by Mr. Apsley, states that "Neither in sharp business contest nor supremacy in the rubber business, nor in panics, nor war times have they failed to meet their paper at maturity. They have never passed a dividend, paying regularly 7 per cent. on preferred stock, and from 4 to 40 per cent. on common stock."

"Its thirtieth anniversary finds the company in the most prosperous condition in its history, having done in the first quarter of this year the largest business it has ever done, being 20 per cent. more than during the first 3 months of last year, while the first month of the second quarter of this year shows an increase of 30 per cent. over last year."

Costello C. Converse and his wife have notified the First Baptist Church in Malden that they will furnish for the rebuilt church a fine organ with all the latest attachments. The church, which was very largely the beneficiary of Deacon E. S. Converse, of the Boston Rubber Shoe Co. during his life, was destroyed by fire early in the spring, and this action of his daughter and nephew is particularly graceful and generous.

William Noll, advertising director of the Foster Rubber Co., which makes the "Catspaw" rubber heel, is in San Francisco, taking charge of the company's exhibit at the Panama-Pacific Exposition. Mr. Noll not only lets an exhibition get by without springing something new either in the way of a specimen or an exhibit. He always manages to attend the annual convention of the National Shoe Finders' Association, which this year will be held early in June, at San Francisco. The Foster rubber heel is always well advertised at these conventions either by a souvenir presented to each member present, or a special entertainment which forms a feature of the program.

Another rubber heel man from this city who has always taken a prominent part in these conventions is Frank W. Whiteley, head of the house which manufactures the Velvet rubber heel. Mr. Whiteley is also a contributor to the pleasure of the visitors, though perhaps in a less conspicuous way. He is the most active exponent of the movement to limit selling prices of specialties, believing that trade is ruined by cut price competition. Mr. Whiteley is the originator of the movement for "more business men in Congress," and has been heard from at the California convention.

Charles A. Coe, the Eastern selling agent of the United States Rubber Co., who returned in April from a strenuous business trip, and who was stricken with pneumonia soon after, has almost completely recovered and will probably be at his place of business, for a portion of the time at least, by the time this letter is published.

W. M. Gunlock, under whose direction the Spring Step rubber heel has attained so great a publicity, was in Boston the last week of May, making his headquarters at the office of the Revere Rubber Co., which manufactures this heel.

Francis H. Appleton is a delegate to the Shriners' convention to be held in San Francisco next month. He will leave here July 5 for a quite extended trip, a special train being provided for the members of the Mystic Shrine. Several stops will be made at various cities and points of interest, the excursion lasting a number of weeks.

S. P. Sharples, the well-known rubber chemist, is enjoying a period of rest in Florida. There are few younger old men in the industry than Mr. Sharples, and not many better known. Despite his 73 years, he is regularly in attendance at the outings of the Rubber Club of America, Inc., and a participant in some of the amusements there provided.

And, speaking of these outings, many members of the club will be grieved to hear that Elmer Chickering, the "official" photographer of these occasions, whose pictures have graced the pages of THE INDIA RUBBER WORLD, died last month at the comparatively young age of 53 years. No photographer in New England had a larger acquaintance among celebrities than he, and few more friends.

THE RUBBER TRADE IN RHODE ISLAND.

By Our Regular Correspondent.

THE rubber goods produced at the various factories throughout Rhode Island continue to be in active demand, and every concern is working its plant on full time, or better. Perhaps the greatest handicap experienced is the lack of competent help to meet the increasing demand. There have been unusually large shipments of tennis shoes from two of the plants, and apparently the demand has not abated yet, although the output since the first of the year has been phenomenal.

Receiver Curtis of the defunct Atlantic National Bank of Providence, who, in that capacity, was the principal creditor of the Walpole Tire & Rubber Co., at Walpole Massachusetts, made the announcement a few days ago that the Revere Rubber Co., which operates an extensive plant on Valley and Eagle streets, had purchased part of the machinery of the plant at Walpole and would operate the plant there temporarily and possibly eventually purchase the entire plant. He also stated that Robert C. Fisher had been employed by the Revere company as its manager at Walpole. He was made treasurer of the old Walpole company by Mr. Curtis, and later receiver.

"The old stockholders," according to a statement made by Mr. Curtis, "will suffer a total loss on their holdings of Walpole stock and both classes of that concern's stock are now worthless. Thousands of dollars of both preferred and common stock of that company were held here. This stock was put up as collateral for a number of loans made by the Atlantic National Bank. The stockholders' reorganization, of which Michael J. Houlihan, of this city, vice-president of the Walpole company, is a member, in a letter sent out the latter

part of April, practically withdrew from all further negotiations and gave notice of the return of the deposit money."

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About 350 people are now employed at the factory of the Narragansett Rubber Co. on Wood street, Bristol, and 35,000 pairs of shoes are being turned out each week. Mr. McCarthy, the manager, however has announced that there is need of experienced sewing machine operators and shoe makers at the factory.

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The Tayson Rubber Co. has been incorporated, under the laws of Rhode Island, by Alfred G. Chaffee, John A. Tillinghast and Teresa E. Mullen, the capital of the new concern being fixed at \$100,000.

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The International Rubber Co., of West Barrington, is enjoying a considerable increase in the volume of its business, which has necessitated numerous changes and additions in order to give adequate facilities. One of the most important additions has been the building of a new vulcanizer on the west side of the factory.

THE RUBBER TRADE IN TRENTON.

By Our Regular Correspondent.

ARTHUR R. FOLEY, of the traveling staff of the Home Rubber Co., went to his death when the liner "Lusitania" was sunk, on May 7, by a German submarine. He was bound for the London office of the company, on his fifth voyage in the interests of his employers. Mr. Foley's name did not appear among the first lists of the dead, and his many friends were buoyed with hope until official confirmation of his death was wired the Home company by Secretary of State Bryan. The body has been brought home for burial, arriving in New York May 24 on board the "New York" of the American line. Further mention of Mr. Foley will be found among the obituary notices in this issue.

The death of Elbert Hubbard, who was a victim at the same time of German submarine activities, was also a matter of particular regret among those in the trade who met him when he visited Trenton shortly before sailing. Mr. Hubbard inspected the plant of the Empire Rubber & Tire Co. and had promised to write his impressions in a booklet which he expected to issue at an early day.

The plant of the Brookville Rubber Co. in West Trenton is being dismantled, preparatory to removal of the equipment to the Panther Rubber Co.'s plant at Stoughton, Massachusetts, in the interests of economy. The Trenton plant, under the direction of R. W. Lane, has been used by the Panther company for reclaiming rubber by means of electricity, a process perfected by Mr. Lane. The system in use does away with the acid process and devulcanizing, as ordinarily understood. The Panther company acquired the old Plymouth plant at Stoughton some time ago and has since carried on its manufacturing there. An addition to accommodate the reclaiming department has just been completed adjoining the Stoughton plant. About twenty employees will be affected by the removal.

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An order for 500,000 gross of jar rings is among the business recently booked by the Acme Rubber Manufacturing Co. Augustine W. Waldron is a new member of the Acme traveling staff.

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The Paramount Rubber Co., which started business here about two years ago, has already built up an enviable reputation in the manufacture of tennis and rubber hand balls. The product of this concern has been so much in demand since the first of the

year that it has been necessary to run both day and night shifts of workers. The Paramount company is owned by R. H. Rosenfeld, of Cleveland, Ohio, and Fred L. Roberts and J. R. Smith, of Trenton.

The Max Grich Rubber Co. is planning the construction of a small crepe store about 25,000 sq. ft. in area, for which work has been recently commenced.

This company, through its president, Mr. A. DeFosse, has generously offered to provide lunch for the 1000 or more children who are expected to participate in the annual picnic to be given by the United Automobile Club, which is to be held in a sufficient number of their automobiles.

Harry Freedman, a dealer in scrap rubber, has been indicted by Judge Adams all in Vermont, charged with the theft of the Max Grich company from the J. H. DeFosse company. It was charged that Freedman and Joseph Verre, an employee of the company, had in his time, more or less, stolen scrap rubber that he had actually purchased.

The scrap rubber dealers have been in considerable trouble of late. Some of the dealers have even gone so far as to patch up tires and sell them as if they were new, passing them as products of the companies which had stamped their names upon them. To meet this situation the factories have adopted a plan of mutilating defective tires so that it is impossible to "assemble" the parts.

Trenton promoters have leased a building at Spotswood, New Jersey, where they propose to manufacture a line of drug sundries. Dr. J. G. Denelsbeck is at the head of the movement.

Robert L. Logan, formerly Trenton representative for the National Cash Register Co., has been appointed manager of the Pittsburgh office of the Empire Rubber & Tire Co.

The Universal Tire & Tube Market has been established at 240 North Broad street, this city, to "reclaim" tires by the process of stitching together two worn casings, one over the other, a method of utilization of old tires which since the war is said to have become quite common in Europe.

A handsomely engraved cup, presented by the Vulcanized Rubber Co., to be contested for in the Delaware River Baseball League, has been on exhibition in the window of a Trenton sporting goods store. It has attracted much attention.

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John L. Brock, a leading auto dealer, in a recent Trenton address, took the position that the manufacturers of automobile tires are not trying to sell as many tires as possible to a few people, but are trying to sell as few tires as possible to many people. In other words, it is to the interest of the manufacturer to have his product give long service, as this will eventually mean most to him.

THE RUBBER TRADE IN AKRON.

By Our Regular Correspondent.

PAUL E. WERNER, for many years identified with the printing and publishing industry, is preparing to enter the rubber trade. He is now working on plans for the organization of a \$1,000,000 rubber company for the manufacture of tires and other rubber goods. Although the location of the new plant has not been decided upon it is reported that it will be located in a Kansas city.

It is understood that the financing has been practically completed, and that the company will be incorporated soon. Mr. Werner is more than 65 years of age, and for about forty years was at the head of one of the world's largest printing and publishing concerns. He retired from the New Werner Co., now the Superior Printing Co., about two years ago.

Work was started May 11 on the new six-story factory building, to be located on the site of the old one, and to be completed early in the summer. It will be the largest and most modern of the kind ever built in the South. Mr. Werner is planning to employ about 1000 men, and will be manufacturing all kinds of rubber goods, including tires, and will also be manufacturing a large quantity of rubber goods for export.

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Mr. A. V. Seifert, president of the Goodrich company, recently visited the University of Akron at the World Congress at Cleveland, Ohio, May 12-14, held in the interest of international peace.

* * *

Officials of Akron rubber companies decline to discuss as being "too still" newspaper reports of the past month that a merger of the big tire companies of the United States is being considered.

According to unofficial reports, Akron's three largest rubber companies, the Goodrich, Goodyear and Firestone, are paying more than \$40,000 to employees weekly. The figures represent an increase of more than 20 per cent over the same period of one year ago.

An addition to the Fells Rubber Co. will be completed early in September. It will be 8x200 feet, three stories high. This company is making a tire with black tread.

Line men making an excavation under the Miller Rubber Co.'s warehouse early in the month undermined a brick wall, causing a partial collapse and slight damage.

T. C. Marshall denies reports that the Kelley-Springfield Tire Co. has decided to leave Akron. Although the local plant has had some trouble getting a proper water supply, it is said that no arrangements have been made to move the factory to another city.

The Limousineless Tire Co. is the latest rubber company to be incorporated in Akron.

Rubber companies here are supporting the Akron chapter of commerce in its fight to prevent the sale and abandonment of the Ohio and Pennsylvania purposes. O. C. Barber, Akron's managing director, has offered to purchase the old Ford to build a rubber plant on the site of the Ohio river.

More than 300 "buses" are being operated in Akron at present, the largest number operating on Saturday afternoon and Sunday afternoon. If the employees of the largest rubber companies of the city are to be taken into consideration, there are about 2000 cars are operated daily. The rubber tire business in Akron this year has brightened.

The India Rubber Trade in Great Britain.

By Our Regular Correspondent.

GENERAL REMARKS.

THE rush of Government orders having to a large extent been disposed of, it was expected that the rubber trade outside the tire branch would experience a somewhat slack time. This, however, has not been the case, the proofing works, and more especially the mechanical rubber works, where slackness has been noticeable during the winter, now reporting business as being decidedly brisk. The shortage of labor has resulted in the employment of women on work in former times exclusively handled by men.

For the time being, the question of a special tax upon manufacturers largely engaged in government contracts has been abandoned, though the matter was expected to find reference in the budget. Considering the uniform and comparatively low price of rubber, the announcement of a 10 per cent. advance in prices by the Silvertown company has caused some surprise, despite the rise in wages and in the price of certain chemicals. The action of the India Rubber Manufacturers' Association is now being awaited with interest.

OUTPUT OF TIRES.

I have been asked by your Editorial Department if I can give the number of pneumatic tires and also solid tires manufactured in any recent year in England and France. No doubt individual manufacturers know their own outputs, but they keep such knowledge to themselves, in accord with the secrecy which characterizes their general procedure. By way of seeing if any information on the point was obtainable, I put the query to a rubber works manager, asking for a rough estimate, and his reply was 2,000 pneumatic tires and 1,000 solid tires per working day for Great Britain. These seem large figures and no doubt if others care to support or revise them the editor will be pleased to find room for correspondence on the subject.

AMERICAN TIRES.

The B. F. Goodrich Co., Limited, is rapidly adding to its provincial depots in Great Britain, the Glasgow and Manchester establishments being now followed by others at Bristol and Leeds, with more to come, it is understood. A few months ago I referred to the establishment of the Firestone Tire Co., Limited, in London, doubtless in friendly rivalry. The increased use of American pneumatic tires is shown by their common occurrence with Michelins, Dunlops, etc., in reclaimers' yards.

DENTAL RUBBER.

As far as I can gather, the war has not interfered with the supplies of dental rubber, as these come very largely from America, supplemented by the products of one or two home firms. This is one of the few branches in which German competition has been absent, a fact which may have something to do with the high prices charged to British dentists. A prominent practitioner who has some satisfactory investments in rubber plantation companies complains that though the prices were raised by American suppliers of dental rubber to conform to the 12s. 6d. per pound level of raw rubber, they have not yet been reduced and the fact that the American products are still bought speaks for their high quality. Of course ten years ago dentists did not follow the course of the raw rubber market, but things are now different, so many of them having monetary interests therein.

The latest variety of American dental dam or thin pure sheet, which is in great favor in this country, is practically colorless instead of the ordinary brown color of cut or spread

sheet. Obviously, this is made of the colorless rubber produced from plantation latex by the method described at the first London rubber exhibition by Mr. Kelway Bamber. I understand that similar sheet is not as yet obtainable in England, though I know that such rubber was used for certain purposes a few years ago by one of our important rubber works producing surgical goods.

With regard to the manufacture of rubber goods for sports, the summer season bids fair to be as bad as the past winter. County cricket has been abandoned, many of the palatial pavilions being now utilized as Red Cross hospitals, and ordinary club cricket will be much curtailed. There are to be no lawn tennis tournaments, and though the game will be played at clubs and private houses, this will mean a great falling off in the demand for balls, especially as very few of the clubs will play matches. As sporting goods are made by a number of rubber works now fully engaged in other branches, it cannot be said that they will feel the loss of trade to the same extent as the wholesale and retail houses which specialize in such goods.

NEW ISSUES.

New undertakings have been few and far between in the last nine months. On April 12, however, the Searle Rubber Co., Limited, was registered, with a capital of £12,000, including 4,000 5 per cent. cumulative preference shares. An agreement has been adopted with the Searle Unburstable Inner Tube Co., Limited, relating to a license for the manufacture of these tubes. The new company is an offshoot or subsidiary of the older one which will continue its existence and trade in the tubes as before. The Searle tube is of rubber reinforced with canvas and has been on view for two or three years at motor shows. It has proved its utility in motor tires in withstanding rupture from shock and it is immune from many of the attacks which mean disaster to the ordinary inner tube, though of course it can be cut by anything sufficiently sharp which it may encounter on the road.

An important step has been taken towards the fulfilment of the project to lay sections of rubber street paving in London and elsewhere. Under the auspices of the Rubber Growers' Association a company has been registered with a capital of £90,000 to acquire certain patents and to apply them to road paving. The system in question consists of rubber capped hardwood blocks, so made as to key into each other. A small section has been under trial in London for more than a year, and has received the highest commendations of the local surveyor. Primarily, the object of the sponsors of the undertaking is to further the consumption of plantation rubber, although the scheme obviously has great commercial possibilities. The company will presumably carry on its operations with subsidies of rubber from the plantation companies, each concern guaranteeing to contribute a certain annual per centage of its crop at what is approximately the prime cost. Such cash as may be required will be provided by the issue of preference shares amounting to £20,000. The company could hardly make a better start with its paving scheme than to re-lay the section of roadway which Londoners conceive to be the very center and hub of the universe, namely, the road in front of the Bank of England, Royal Exchange and Mansion House, where eight thoroughfares converge as spokes into the hub of a wheel.

The Government-backed British Dyes, Limited, has gone to allotment and manufacture is now in the initial stages. This big project will alter the tar distilling industry of Great Britain to some extent, and it may be that the days of cheap

solvent naphtha are numbered. As regards the importation of coal tar dyes from Germany, America is of course in the same state as ourselves, and it will be of interest to see if she follows the British lead on the smaller scale necessitated by lack of sufficient raw material. Only quite small quantities of aniline or other coal tar colors are used in our rubber industry, the coloring of toy balloons being the principal application.

THE MARKET FOR CHEMICALS.

According to the price list given in the April issue of THE INDIA RUBBER WORLD the most interesting feature in America is the scarcity of all coal tar products. This is by no means the case here, because our production of these chemicals from gas tar and also coke oven tar has been much more completely developed. Our superiority over all other countries lies in our far greater output of gas tar, which contains a larger amount of benzol and toluol than does the German tar, which is mainly derived from coke ovens, though both countries, as also America, extract considerable quantities of benzol containing some toluol from coke oven gases. Benzol of 90 per cent. is now readily obtainable at the price of 10 d. per gallon, and solvent naphtha is at about ordinary figures.

With regard to accelerators, the list is being rapidly added to by rubber chemists, the latest additions to the patented list including benzyldiene-aniline, hydrobenzamide and naphthylenediamine. The only chemical which is really worrying the trade on this side is oxide of zinc, and the American product has the chance of its life time to effect an entrance through doors hitherto closed to it. Caustic soda, an article nowadays of more interest to the reclaimer than to the manufacturer, has had a considerable advance in England, though not so in America. The price on this side is regulated by a convention, and many large users buy soda ash and causticise it themselves, a method in which so far the reclaimers have not followed suit.

A number of the leading British solid tire manufacturers have decided to guarantee their tires in future only for a service of 10,000 miles, within a period of 12 months.

The Dunlop Rubber Co., Limited, of Birmingham, paid on May 1 an interim dividend on its ordinary shares at the rate of 10 per cent. per annum. This company has recently completed additions and improvements by which its capacity has been greatly increased.

Lieutenant Gabriel Ravel, commercial manager of the Michelin Tire Co., of France, has been made Chevalier of the Legion of Honor in recognition of his gallant conduct in battle, where he was seriously though not dangerously wounded.

IMPERIAL INSTITUTE REPORT ON BRITISH GUIANA RUBBER.

The report of the Imperial Institute, of London, on two samples of *Hevea* rubber from British Guiana, shown at the London rubber exhibition and later forwarded to that institute for examination, states that the samples were quite satisfactory as regards preparation, composition and physical properties and that consignments of similar character would always be readily salable at prices closely approximating those of fine plantation Pará from the East. These samples, which were from the government stations at Issororo and Onderneeming, were valued commercially at about 2s. 3d. and 2s. 2d., respectively, per pound, as compared with first quality biscuits at 2s. 4d. to 2s. 4½d. per pound.

Exports of balata from British Guiana from January 1 to April 22 of the present year show an increase over those of the same period of 1914 from 273,051 pounds to 451,100 pounds—369,460 pounds of this quantity being shipped to the United Kingdom and 81,640 pounds to the United States. Exports of rubber for the same period of 1915 amounted to 825 pounds.

WORKING FOR THE WAR SUFFERERS.

A. Stames Manders and Miss D. Fulton are continuing their activities in the way of securing subscriptions for war sufferers. Incidentally, no expenses are charged against the amount subscribed, which means, of course, that their work is not only voluntary but absolutely without remuneration. They are now assisting in the organization of a benefit for the work of the Red Cross of the allied armies. To raise money for this a fête is to be given at Calais, where thousands of poor people are being fed, clothed and sheltered. Miss Fulton and Mr. Manders, at the request of the Mayor of Calais, are securing subscriptions for this excellent work. This request, by the way, came through Capitaine-Commandant Leon Osterrieth, of Belgium, whom visitors to the last rubber exhibition will remember. The necessity for help in Calais, and immediate help, is apparent, and Mr. Manders urges all who are interested to send subscriptions, no matter how small.

SOLID RUBBER TIRES IN THE WAR.

The important role motor transport and solid rubber tires are playing in the present war is no secret, but it is perhaps not generally known that the conditions under which these tires are giving service in the European war zone are quite new and such as no tire was built to encounter. The famous "paves" or granite block highways of Northern France, were always a terror to automobilists, but under war conditions these miles of bumping causeways have been made even more impossible. Solid tires are torn and shattered at their bases and wrenched from their rims long before the tread is worn, and 4,000 miles appears to be about the limit of their service capacity. Over cobblestone pavements, followed for hundreds of miles, day in and day out, tires of considerable resiliency are required, attached to rims by a very wide base. In most solid tires there is not sufficient graduation between the resilient part of the tire and the hard vulcanite base which adheres to the steel band on which the tire is built. The transition is too abrupt, and the consequence is that on roads naturally very rough and further torn to pieces by shell fire and excessive traffic, these tires are torn from their steel bands in a comparatively short time. The ideal tire for service, under such conditions as now exist in the war zone in Northern France, should be wide at its base, and the resilient tread should harden gradually as it approaches the hard ring where the tire is vulcanized to its steel retainer. No doubt the constant hammering to which solid tires are subjected on the "paves" causes the rubber to crystallize and become brittle at the point where it is made hardest in the course of manufacture.

BRITISH RUBBER MANUFACTURERS ADVANCE PRICES.

Three of the large British rubber manufacturing companies—the North British Rubber Co., Limited, of Castle Mills, Edinburgh; the Dunlop Rubber Co., Limited, of Birmingham, and the Waverly Rubber Co., Limited, of Edinburgh—have announced an advance of 10 per cent. in prices, due to increase in working expenses and in the cost of materials entering into the composition of their product. In the case of the first-named company the advance applies to belting, hose, sheet rubber, packing and mechanical rubber goods. The Dunlop advance applies to rubber tires and their accessories, and the Waverly advance to boots, shoes and waterproof clothing, etc.

Of the imports of crude rubber and gutta percha into Russia in 1913—which amounted to \$20,680,487—\$3,066,035 of this total was received from the United States. Exports of manufactured rubber goods from Russia to the United States for the year ending June 30, 1913, amounted to \$35,270, and similar exports of rubber scrap for the same period were valued at \$641,002.

Conditions In the German Rubber Industry.

IN Germany the fiscal year comes to an end March 31, and this date is always preceded and followed by a slack period in business activities. Accounts are closed and inventories taken, not only by municipal and state administrations, but also by rubber manufacturing concerns. This year, on account of the war, the dull inventory period was more marked than usual, even in the lines that have been kept active by war demands. The army reduced its orders for immediate deliveries to absolute necessities so as to extend payments, with the result that March was an unusually quiet month. But immediately after Easter the situation changed for the better.

The outbreak of the first days of April caused renewed activity at the front and resulted in a demand for immediate delivery of all orders. Then the labor shortage was seriously felt. The army authorities had granted leave of absence to all the skilled labor that could be spared without weakening the lines at the front. This relieved the labor shortage in rubber factories working on army contracts, but did not help factories working for private trade. However, it is said that those who have taken the place of the skilled labor called to the colors have adapted themselves to new occupations remarkably well.

According to the "Gummi Zeitung," the war has caused many branches of the rubber trade to flourish as they never did in times of peace, and furthermore, the great struggle has brought about an unprecedented condition of co-operation and organization among rubber manufacturers. Price-cutting has disappeared and many manufacturers express the hope that the *esprit de corps* of the German rubber industry may last after the war and its good effects continue in times of peace.

Further evidence of the shortage of crude rubber in Germany is shown in an order of the mayor of Breslau, in which he thanks his fellow citizens for their zeal in collecting metals for war purposes and asks that they similarly collect bicycle castings and tubes, old rubber shoes and all household rubber articles that can be spared. This old rubber is to be regenerated and re-manufactured. Similar notices have been issued by the municipalities of Kiel, Cassel and other German cities.

Certain German merchants have been sending to neutral countries, as samples of no value, quite a number of articles placed on the export prohibition list by the German Government. The Berlin chamber of commerce has issued a warning to these merchants, telling them that the sale abroad of even a single prohibited article exposes them to the most severe punishments.

Commenting upon the much discussed discovery by W. F. Rittman of a new process making it possible to extract 200 per cent. more gasoline from petroleum than was possible with former processes the "Gummi-Zeitung," printed in Germany, says: "We wish to call attention to the fact that the Rittman process is based upon the experiments of Messrs. Krey and Kraemer who also used distillation under pressure. The methods of these two noted investigators were too costly to ever receive commercial application and this fact alone must cause the Rittman discovery to be greeted with less enthusiasm. Furthermore, residues of crude oil are highly valuable for manufacturing lubricants. In fact they are much more valuable in the shape of lubricating oils than when converted into gasoline. It will always be more desirable for America to extract benzol from coal gas residues than to extract this cheap hydrocarbon from valuable mineral oil."

RECENT REPORTS OF GERMAN RUBBER COMPANIES.

In the annual reports published recently by the most important German manufacturers of rubber goods, it would appear that many of them had a premonition of the imminence of war, as almost without fail they had provided themselves with unusual stocks of crude rubber and other raw materials essential to their

industry. The salient facts of the most important of these reports is given below.

CONTINENTAL CAOUTCHOUC UND GUTTAPERCHA CO., HANOVER.

Business was good during the first seven months of 1914 but came to a sharp standstill with the beginning of war. Owing to large supplies of raw materials no difficulty was experienced from this source and the company was able to continue shipments to neutral countries until the government placed an embargo on all exports of rubber goods. Practically all work now being done is for the army and navy. Net profits for 1914 amounted to 5,722,102 marks [\$1,361,860].

HANNOVRSCHER GUMMIWERKE "EINLEISTUNG" A. G., HANOVER LINDEN.

The first seven months of 1914 were prosperous, especially because of the low prices at which raw materials were obtainable. When the war broke out nearly all the employees were called to the colors and business came to a stop and remained inactive until arrangements were made to meet the new conditions and the railroads were opened to commercial traffic. Then, thanks to the ample supplies of crude rubber and other raw materials in stock, the company was able to do a very satisfactory business. The losses in foreign countries involved in the war are considerable, but cannot be determined definitely for the present. The net earnings for 1914 amounted to 1,055,578.85 marks [\$251,228].

MANNHEIMER GUMMI, GUTTAPERCHA & ASBEST-FABRIK A. G., MANNHEIM.

Until the war broke out business in 1914 was quite normal, except in the asbestos department, which was somewhat behind on account of unfavorable prices in this line. Towards the end of the year business, which had been stopped by the outbreak of war, returned to something near the usual level. December 7 marked the fiftieth anniversary of the founding of the company, but, owing to conditions, this date was not the occasion of any notable festivities. The net profits for the year amounted to 294,089.75 marks [\$69,993].

FRANKFURTER ASBESTWERKE A. G., FRANKFORT, A. M.

The beginning of 1914 was not altogether favorable to the asbestos industry and the first seven months showed a decrease of about 10 per cent. as compared with the previous year. The war deranged all industries, but, owing to the company's foresight, it had a very large supply of raw material and this saved it from great losses, and made it possible to show at the end of the year net profits amounting to 126,920.42 marks [\$30,207].

KOLNISCHE GUMMI-FADEN-FABRIK, COLOGNE-DEUTZ.

Active business was experienced during the first seven months of 1914, but it stopped abruptly with August. The company was not fortunate enough to have a large stock of raw material on hand and much of the crude rubber it had purchased abroad, as well as rubber consigned to it but still in transit, was never delivered. The net earnings for the year amounted to 112,236.85 marks [\$26,712].

VEREINIGTEN BERLIN-FRANKFURTER GUMMIWARENFABRIKEN, BERLIN-LICHTERFELD.

The brisk business of the first half of 1914 was terminated by the sudden outbreak of war, but luckily the company had ample supplies of raw material and the good fortune to receive very large government orders. The net profits for the year amounted to 405,566.55 marks [\$96,525].

HANNOVERSCHE KAUTSCH- GUMMIWAAREN-FABRIK, HANOVER-LINDEN.

The twenty-eighth annual report of this company states that the first half of 1914 showed normal business, with a tendency to increase, when the war stopped all work, and matters did not return to anything near the normal until October. The net profits for 1914 amounted to 212,287.95 marks [\$50,525].

VEREINIGTE HANESCHLAUCH- U. GUMMIWAAREN-FABRIKEN ZU GÖTTA A.-G., GÖTTA.

The first seven months of 1914 showed marked progress in the company's business, but war put a stop to everything. Army and navy orders, however, kept the factory in operation. Very high prices were paid for raw materials, especially crude rubber, practically the whole stock of which was taken over in November by the government. The net profits for the year amounted to 154,898.62 marks [\$46,386].

ASEESTU GUMMIWERKE A.-G., ALFRED CALMON, HAMBURG.

The favorable conditions present at the beginning of 1914 lasted until war broke out and stopped all business activity. Scores of the company's men were called to the army, shipments by sea were totally shut off, land traffic was closed to commerce and payments postponed. Work was, however, later reorganized and the company has been attending to private business as much as extensive government orders would permit. Funds were used to help war sufferers among the company's employes and workmen. After the war was declared the company decided to use its crude rubber supplies strictly for military orders. The net profits for the year amounted to 506,726.41 marks [\$120,601].

UNGARISCHE GUMMIWAAREN-FABRIK A.-G., BUDAPEST.

For the first six months of last year the business of this company was very good, but naturally both export and domestic trade came to a standstill with the beginning of hostilities, though by reason of important war orders and arrangements made with the government the factories were kept busy. The company had installed new machinery in 1913 for tire manufacture, and was therefore well prepared to handle the Government's orders. The supply of rubber was sufficient until the latter part of December; since which time the company has been greatly hampered because of the difficulty of obtaining crude rubber. The net earnings for 1914 amounted to 1,538,456.72 crowns [\$312,307].

WAR CONTRIBUTIONS BY THE GERMAN RUBBER INDUSTRY.

German manufacturers in general have made great sacrifices in helping their employes and persons dependent upon them through the distress occasioned by the war, and in this line the German rubber industry has not been backward. Some figures from the annual report of the Continental Caoutchouc & Gutta-Percha Co. are exceedingly interesting. Speaking on this subject the report says: "From the beginning of this war we have considered it our natural and most important duty to help the families of those of our employes who are at the front. We believe that these men are doing their full duty in offering their lives to the Fatherland and that they should not, therefore, have the worry of trying to provide for those they were obliged to leave behind. For this reason we opened a 'war account' which, from August 1 to December 31, runs as follows:

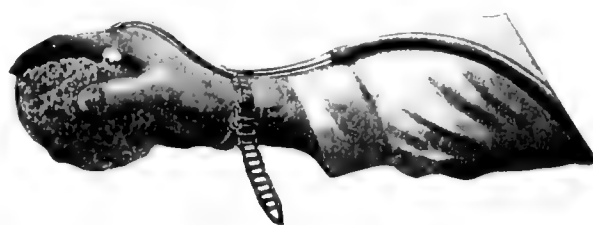
	Marks [a mark = 238 cents]
For supporting the families of our workmen and employes now with the colors	434,142.80
For subscriptions to the Red Cross for the army and navy	67,092.10
For payments to troops passing through, for cigars, cigarettes, tobacco, chocolate, mineral water, etc.	19,970.83
For woolen articles sent to the front	93,039.03
For helping German prisoners of war in foreign countries and for various projects sent to troops in the field	7,564.59
For the upkeep of hospitals	30,377.55
Total	652,186.90

This report was read at the annual meeting of the Continental company shareholders, and at this same meeting half a million

marks (\$119,000) was voted for supporting those left by employes and workmen of the company who had fallen in battle, making a total of war expenditures amounting to \$274,220.

A GERMAN FOUNTAIN SPONGE.

This is a fountain sponge of German origin especially adapted to washing surfaces where sand and grit must be removed. The sponge, which may be either natural or made of rubber, is connected through a nickeled tube with a rubber hose leading



to the source of water supply. The nickeled tube is attached by a strap to the back of the user's hand, as shown in the illustration. [Julius Putsch Co., Frankfurt, a M.]

CONSOLIDATED RUBBER AND BALATA ESTATES, LIMITED.

At the annual meeting of the Consolidated Rubber and Balata Estates, Limited, which was recently held in London, the chairman of that company, whose property is in British Guiana, stated that they had harvested during 1914, 1,076,067 pounds of balata, but that owing to the breaking out of the war they experienced great financial difficulties, which, however, they were able to overcome, thanks to the timely assistance tendered them by the Governor of British Guiana. When the war broke out they had a huge stock of balata on hand and heavy liabilities in the way of bills, loans and overdrafts which amounted in fact to about £60,000. Conditions had improved somewhat, and the company had now £50,000 to work with. The chairman promised that dividends would be paid upon receipt of money as the balata was delivered. Before the war Germany was the company's principal customer.

RUBBER AND BALATA EXPORTS FROM TRINIDAD.

During the year 1914, \$46,382 worth of balata gum was exported from Trinidad to the United States, as compared with similar exports valued at \$17,809 in 1913, showing an increase of \$28,573.

RUBBER MACHINERY IMPORTS INTO PANAMA DUTY FREE.

A new law No. 39 of 1915—was enacted by the National Assembly of Panama on February 24, to become operative May 25 of the present year, by which the customs tariff of the Republic has been revised. Articles of import are now classified under four divisions. Under class one, which covers "articles free of duty," are placed machinery for the treatment of rubber, also sulphate, bisulphate and bisulphide of carbon.

BRAZIL SUSPENDS DUTY INCREASE ON RUBBER GOODS.

The following is the substance of a cablegram received by the Department of Commerce, at Washington, from the United States Consul General at Rio de Janeiro and published under date of May 24:

Owing to the impracticability of enforcing it, it has been decided to hold in abeyance the provision of the Brazilian budget law for 1915 prescribing increased import duties on rubber goods in the manufacture of which Brazilian fine Para has not been used and authorizing special reductions on articles made of such rubber. It is stated that the matter will be again submitted to the Brazilian Congress, which is now in session, and that pending further action the former rates of duty will be applied in the case of the following articles: Surgical instruments and supplies, insulated wire, floor coverings, and rubber tires. Such concession will only be made upon condition that the importer obligate himself to pay the difference in duties in case the provision is not repealed.

PRESENT AND PROSPECTIVE PLANTATION PRODUCTION.

By Our Regular Correspondent.

THE export of plantation rubber from the Federated Malay States during the month of April, although in advance of the total exported in the corresponding month last year, is substantially below the aggregate for March. The following is a comparative table, showing the export for three years:

	1913.	1914.	1915.
January	2,131	2,542	3,473
February	1,757	2,364	3,411
March	1,737	2,418	3,418
April	1,626	2,151	2,777
Total	7,251	9,475	13,079

April is always a light cropping month in Malaya because it comes within the period when the trees shed their leaves. This year the wintering of the trees is said to be rather later than usual.

As might be expected, in view of the shrinkage in the total exports of plantation rubber from this part of the world, the individual crops of many of the old-established estates show a like falling off. The following table of comparative yields for the month of April illustrates this tendency towards reduced crops from the older estates in the Malay Peninsula:

Company.	Yield for April	
	1914.	1915.
Anglo-Malay	96,800	88,700
Batu Caves	44,700	42,000
Bukit Rajah	44,200	40,500
Damansara	43,900	41,400
Goldend	32,500	27,200
Hempden	33,600	24,200
Highlands	83,100	60,250
Kapar Para	49,600	24,000
Kuala Lumpur	86,000	83,000
Linggi	82,800	81,200
Pataling	46,200	41,000
Selangor	51,800	44,760
Sungei Keras	51,000	35,600
Sungei Way	34,111	32,800
Tremblay	45,100	33,500

It must not be inferred from the foregoing that all the plantations are reducing their outturn, for the statement only applies to companies at or near maximum production. Practically all plantations having considerable areas of young trees still show substantial crop increases every month. The older estates are, of course, suffering for past misdeeds. These include unskilled tapping in the early days of the industry; excessive tapping at a subsequent date, and, in all cases, too close planting. It is now the order of the day to thin out existing areas, to moderate tapping so as to give a longer period for bark renewal, and in some instances it has been found necessary to rest the trees entirely. All these factors tend to reduce the output and render some of the estimates made of the total production of rubber this year far too sanguine.

HIGHLANDS AND LOWLANDS.

The reduced output shown by Highlands is no doubt partly due to the damage caused by a cyclone which recently visited the property. In view of the standing which this company enjoys in the rubber market, the following extract from the chairman's speech at its annual meeting, held a week ago, will be of interest. "On the whole, you have no doubt gathered that everything is satisfactory, and the prospects for the current year are decidedly favorable, even though I have to tell you that we have heard by cable of a violent wind storm, which has done serious damage, and the latest information is that we have lost 8,000 trees on Highlands and 25,000 trees at Batu Unjor, in consequence of which the estimated production for the current year, which was placed at 1,240,400 pounds, must be reduced by 122,000 pounds, which will make it 1,118,000 pounds."

THE SYNTHETIC BOGEY.

This is the season of plantation company reports, and in the mass they provide some very instructive reading, not untinged with humor. For example, the chairman of Kuala Selangor, a

plantation company that has paid fine dividends for a number of years, let himself go on synthetic rubber to the following effect: "By the way, there is one little matter that I might refer to, viz., that old bogey, synthetic rubber—that peculiar compound of artichokes and sea sponge which was to oust our plantation product. I think that we may finally dismiss the resilient bogey from our minds. He appears to jump forward at intervals, but his resiliency seems to be the only thing that he has in common with our product."

At the same meeting some interesting facts were given concerning yields and producing costs. The oldest trees on the plantation are 8 years of age, and this section gave 500 pounds of rubber per acre. Eventually it is expected that the estate will give 600 pounds per acre all over, and that the costs of production will not exceed 7d. per pound all told. The costs during the past season were at the rate of a trifle over 9d. per pound, and would have been less but for the war.

OUTLOOK FOR RUBBER.

At another annual meeting Mr. McEwan, the late chairman of the Rubber Growers' Association, dealt with the outlook for rubber. During the first three months of 1915 the quantity imported into the United Kingdom from Malaya and Ceylon showed an increase over the same three months of 1914 of 7,940 tons, while the quantity from Brazil and all other places showed a decrease of 3,718 tons. The net increase was 4,222 tons. There are indications that within this year the aggregate of importations will far exceed any previous total. The United States Rubber Co. has in the island of Sumatra 42,725 acres of planted rubber. Allowing only a yield of 400 pounds per acre, this area can produce 7,600 tons per annum, and when a purchasing power of that volume is removed from the sphere of competition for what we produce, it is bound to have some effect. "There will doubtless one day come a struggle," he concluded, "and it is well that producers should combine to place all their energies on the development of new uses for rubber."

STRAITS SETTLEMENTS RUBBER EXPORTS.

A cablegram received by the Malay States Information Agency from the Colonial Secretary, Singapore, states that the export of plantation rubber during the month of March amounted to 2,477 tons as compared with 2,741 tons in February and 1,285 tons in the corresponding month last year.

The following table gives the comparison month by month for three years:

	1913.	1914.	1915.
January	784	1,181	1,576
February	743	1,703	2,741
March	898	1,285	2,477
Total	2,425	4,169	7,794

These figures include transshipments of rubber from various places in the neighborhood of the Straits Settlements, such as Borneo, Java, Sumatra and the non-Federated Malay States, as well as rubber actually exported from the colony, but do not include rubber exports from the Federated Malay States.

COLD STORAGE FOR RUBBER.

Refrigeration of rubber was strongly recommended at the International Congress held in Vienna in 1910, and it appears that European rubber manufacturers have, to a certain extent followed the recommendations made there. But not so with producers and dealers in crude rubber. The fact that the latter have not taken up refrigeration and cold storage is perhaps due to the uncertain character of the rubber market and the fear of increasing the cost of production. However, it might be interesting to subject crude rubber to refrigeration immediately on being collected and to preserve it by cold until it is delivered to the factory.

RUBBER IN GERMAN EAST AFRICA.

EXPORTS of wild rubber from German East Africa, which in 1910 reached a total of 725,584 pounds, with a value of £145,147, fell off to about half that quantity in the following year, and in 1912 amounted to 379,938 pounds, valued at £59,298. The chief rubber-yielding plants native to German East Africa are the *Landolphia Stolzii* and the *Landolphia dondeensis*—the former a vine occurring commonly in the New Langenburg district, north of Lake Nyasa, and the latter a shrubby plant occurring in the southern parts of the Protectorate. Other wild rubber plants are the *Mascarenhasia elastica*, *Landolphia Kirkii*, *Landolphia lucida*, *Clitandra kilimindaria* and *Holarrhena microterantha*. The wild rubber exported has been collected chiefly in the forest reserves of Kimboza, Mouha, Unguru (Morogoro) and Unguru (Bagamoyo). Dar es Salaam and Kilwa are both reported as producing good wild rubber in considerable quantities.

The planting industry, on the other hand, has made rapid progress during the last few years, the value of exports of plantation rubber, including gutta percha, rising from £20,798 in 1908, to £362,012 in 1912. The Ceara rubber tree (*Manihot Glaziovii*) has been most extensively planted, although some attention has been devoted to *Funtumia elastica*, *Hevea brasiliensis* and *Ficus elastica*, the area under these three varieties amounting in 1910-11 to 355 acres, in 1911-12 to 698 acres, and in 1912-13 to 1,035 acres. A small *Landolphia* plantation was also established some years ago at Langenburg. During 1910-11, when the area planted in Ceara rubber had reached a total of 63,222 acres, divided between 248 plantations, the high price of rubber led to severe tapping of the trees, which, with wind storms of some violence, resulted in extensive damage, and this induced hasty extension of the plantations with consequent less thorough cultivation and rise of wages through scarcity of labor. The area under Ceara cultivation had risen in 1911-12 to 81,705 acres, and in 1912-13 to 112,258 acres.

The following table shows the quantity and value of the rubber exports for the years 1911 and 1912:

	— 1911. —		— 1912. —	
	Tons.	Value.	Tons.	Value.
Plantation rubber and gutta percha (destination Germany and the United Kingdom)	671	£180,480	998	£362,012*
Wild rubber and gutta percha (destination Germany)	168	58,568	181	59,298

Attempts have been made to improve the economic condition of the industry in this Protectorate, mainly by means of less expensive methods of tapping and by the utilization of catch crops or of secondary cultures, such as beans and maize.

RUBBER ON THE GOLD COAST.

During the past six years 250,000 Pará rubber plants and 1,500,000 seeds have been distributed by the government of the British Gold Coast Colony, and many trees have reached the tapping stage. The government is instructing and encouraging the natives in improved methods of tapping and preparation of latex, through its agricultural stations. Attempts have also been made to cultivate *Funtumia Elastica*, but the plants have suffered greatly from violent winds and tornadoes.

FIRESTONE TIRES IN SOUTH AFRICA.

Walter C. Airey & Co., of Cape Town, South Africa, have contracted for the distribution of Firestone tires in Cape Town.

Should be on every rubber man's desk—Crude Rubber and Compounding Ingredients; Rubber Country of the Amazon; Rubber Trade Directory of the World.

RUBBER IN THE FRENCH COLONIES.

French colonial possessions exported over 400,000 pounds of crude rubber and 363,999 pounds of balata gum during 1914. Of the crude rubber Cochin China exported at least 300,000 pounds, and the French Ivory Coast of any about 93,422 pounds, while the balata gum was all exported by French Guiana. Of the Cochin China rubber, 292,761 pounds went to France, the balance to Singapore; less than 80 pounds of the total was forest rubber, the remainder being all of the plantation type.

HEVEA IN DAHOMEY.

A French colonial inspector reports that a group of *Hevea brasiliensis* trees planted in 1898-1899 near Porto Novo, French Dahomey colony, is now producing exceptionally well. Prior to 1914 these trees received no regular attention, but in August last year a real attempt at tapping was made, and the trees yielded from 2 to 4 pounds of dry rubber each. Those trees that yielded only 2 pounds of dry rubber were plants that had been mistreated in the course of former tappings and had not altogether recovered from the abuse they had suffered. The swampy soil of the Dahomey colony appears to be especially well suited to *Hevea Brasiliensis*.

"GOHINE" RUBBER.

The French Colonial Department has recently made experiments with samples of rubber prepared from the latex of a vine known as the "Gohine" (*Landolphia Houdelotii*), obtained from the Upper Senegal and Niger districts of French West Africa. Part of this latex came from Konakry, where it was coagulated with lemon juice, part from Koury, where it was produced by spontaneous coagulation. Vulcanized fine Para hard cure was used as a standard in comparing the vulcanized products of these different samples of "Gohine" latex, and the experiments showed that the difference in the manner of coagulation had but very little effect on the vulcanized product. Samples of "Gohine" latex obtained from Portuguese colonies, where it was coagulated with such vegetable acids as lemon juice, Guiana sorrel juice, "manina" and the like, show, when vulcanized, but slight technical differences. "Gohine" rubber can be classed among good vine rubbers, suitable for industrial purposes.

RUBBER IN INDIA.

The latest number of the Bulletin issued by the Imperial Institute, London, contains a report on two samples of *Castilloa* rubber from India, received for examination in July last. The plants were grown experimentally at the Bassein Botanical Gardens, Bombay, from seeds planted in 1907 and transplanted in June, 1908, the trees being watered at long intervals up to 1913. Sample No. 1, the physical properties of which are reported as fairly good, was from male trees. Rubber of the quality represented by this sample would probably be worth about 1s. 6d. [36.49 cents] per pound in London with fine hard Pará at 2s. 6d. [60.81 cents] per pound, and fine plantation Pará at 2s. 4d. [56.76 cents] per pound. Sample No. 2, from female trees, was similar in appearance to No. 1, but softer and weaker, being worth about 3d. [6.08 cents] per pound less. Analysis of the samples showed the following results:

	No. 1	No. 2
Loss on drying at 100° C. (percentage)	1.2	1.2
Carbon residue at 500° C. (percentage)	1.2	1.2
Residue at 500° C. (percentage)	4.2	4.2
Phosphorus (percentage)	4.7	4.7
Ash (percentage)	4.7	4.7

Both samples were in the form of small, irregular balls of dark colored scrap rubber containing some vegetable impurities. The report states that if the rubber could be prepared in the form of sheet it would be more valuable than balls of scrap rubber. The possibility of making sheet rubber depends upon a sufficient flow of latex to allow of its collection in bulk for subsequent coagulation. In the case of these samples it was stated that the latex was thick, coagulating quickly on the tree and being ready for collection the day after tapping.

THE COLOR OF RUBBER.

While for most purposes the color of crude rubber is of no moment, lighter colored rubber is in general more appreciated by consumers and commands a somewhat higher price than if dark colored. This partially arises from the purity and other qualities of the rubber being judged from its color. In any case, it is of interest to consider the factors upon which the color of rubber depends.

In this connection it should be noted that in most cases freshly coagulated rubber, still saturated with water, has a pure white color, which it keeps as long as it retains the moisture. Thus balls of rubber kept under water to which formaline has been added, in order to prevent decomposition, after some months retain a white color. The same may be said of large balls, which only dry gradually from the outside and retain for a long time their internal moisture and whiteness.

As Professor Zimmermann remarks, in his work upon *Manihot*, "it is not infrequently found that the somewhat yellowish tinged latex of the *Manihot Glaziovii* produces a yellowish tinged rubber, while the latex of *Manihot Pitihyensis* has at all times an intense yellow tinge and produces rubber of a golden or brownish yellow color."

It may, however, be observed that even when the latex is pure white it becomes several shades darker in drying, ranging between light yellow, brownish yellow, dark brown, almost dark.

In general the darkening of the rubber is caused by substances already present in the latex, which become dark through oxidation. This may be regarded as a natural darkening. On the other hand, substances added during or after coagulation may influence the color of the rubber. Specks of different colors may also be produced in drying, by bacteria and other causes.

EFFECTS OF COAGULATION ON QUALITY OF RUBBER.

It has been remarked that the question of the effects of coagulation on the quality of rubber has not been fully treated in technical literature. That such has been the case is attributed to the lack of methods for expressing in figures the technical value of crude rubber. The theory has been generally accepted that the best method of coagulation is that which produces an article with a minimum percentage of substances other than rubber, the process being one in which strongly acting chemicals and high temperatures, likely to injure the crude product, will be avoided.

Tests by Schidrowitz and Kaye of *Kickxia elastica* showed that the percentage of resin in dry rubber varied between 5.30 and 7.82 per cent., while pressing in conjunction with a solvent reduced the proportion to 1.74 per cent. A high percentage of resin (8.76 per cent) was found to exist with formaldehyde. Other tests by the same experts showed that different methods of coagulation exercised an influence upon the mechanical properties of the rubber.

In a series of tests Beadle and Stevens determined comparative percentage of acids in Brazilian and plantation rubber, with the following results:

	Acid
Wild Pará rubber	per cent 0.120—0.168
Plantation sheets	0.150—0.292
Plantation crepe	0.017—0.120

Schidrowitz attaches importance to the proportion of acid during coagulation, as with a low acid percentage only agglutination ensues, while too much acid, by destroying the network of its texture, would make the rubber hard and brittle.

MOTOR TRUCKS IN CEYLON

There are now 100 commercial motor vehicles in use in Ceylon, and it is expected that within five years the 6,000 bullock carts still in service will be replaced by rubber-tired motor trucks.

PLANTATION PROSPECTS FOR YOUNG MEN.

A daily published in the Far East warns the young men of England and other countries against viewing the possibilities for lucrative employment on eastern plantations with too much optimism unless they are specially qualified for plantation service. It seems that a good many young men have left England for Malaya expecting to drop into pleasant managerial positions with salaries of \$5,000 a year, and more or less luxurious quarters.

When the plantation rubber boom was on there was such a demand for plantation managers and assistants that a great number of young men who went to the Far East without any special qualifications obtained fine positions. But plantation conditions have changed, salaries have been reduced and genuine qualifications are now expected. Assistants are generally employed in supervising laborers, and consequently they are expected to know at least one of the several languages in use among the coolies. They are expected to study economical working and apply it, and they must know how to handle men. The cost of living has become very high in Malaya, and salaries at the start are small, new men being looked upon as learners. Generally speaking, the present is not a good time to obtain appointments on Eastern plantations.

THE TACKINESS OF RUBBER.

Sometimes, in course of transportation or in storage, crude rubber becomes "tacky," thus losing its elasticity and nerve. This phenomenon has often been attributed to the action of microbes, but a French scientist—M. Bertrand—attributes this alteration or decomposition of crude rubber to the action of physico-chemical agents. He states that when rubber becomes "tacky" it is due to a molecular transformation. Exhaustive experiments made by F. Heim and R. Marquis confirm Bertrand's views, for they state, in giving an account of their experiments, first, that the turning of crude rubber into a pitchy, tacky mass is due to the absorption by the rubber of the oxygen of the air, this absorption being favored by a rise in temperature; secondly, that a small quantity of oxygen is sufficient to decompose a large quantity of rubber, and thirdly, that smoking after coagulation preserves rubber from becoming tacky, at least under the conditions present during their experiments. Air is therefore the enemy of crude rubber, which, in order to keep, must be preserved from it. The action of smoke is to cover the crude rubber with a coating that preserves it from air and therefore formaldehyde and creosote are not really the preserving factors of the smoking treatment of rubber.

A NEW RUBBER-SMOKING INVENTION.

A substance has been invented in Ceylon for the production of a smoke for the curing of rubber, the inventor of which describes it as follows:

"This invention is a composition consisting of the pith and short fibres of the cocoanut husk ground to a coarse powder. To this is added crude petroleum. The whole is then thoroughly mixed and subjected to a pressure of from 20 to 80 tons. For lightly smoking the rubber, the crude petroleum may be left out of the mixture, but to obtain a very good result the mixture should preferably be in the following proportions:—Ground cocoanut fibre and pith 100 parts. Crude petroleum from 2 to 7 parts according to shade of rubber required. When the composition is ready for use, it can be burnt in any ordinary fire place either in one compressed block or by being broken into little pieces, without in any way reducing the quantity of smoke produced. The advantages of this invention are that it will burn without any trouble and will produce a large quantity of smoke without flame at a very small cost."

The duty on exports from Mexico of the guayule plant, either in the natural state or ground, as fixed on October 19, 1914, by General Carranza, in his character as provisional President de facto, is \$15 per 1,000 kilos (1 ton) gross.

(My commission expires March 30, 1916).

Review of the Crude Rubber Market.

NEW YORK.

May 29, 1915.

The receipts of crude rubber during the first week of May were heavy and in some cases prices were cut in order to secure the necessary release. The large buyers, however, failed to enter the market, and by the end of the week prices had fallen off due to the pressure to sell. On May 10 First latex crepe, spot, was 58 cents; Smoked sheets ribbed, spot, 59 cents; Up-river, fine, 59 cents. During the second week a lively interest in the market developed and considerable business was the result, prices advancing strongly. First latex crepe sold at 62 cents, Smoked sheet, ribbed, at 62½ to 63 cents, while Up-river fine was firm at 61 cents. This movement was no doubt due to the manufacturers' desire to stock up in anticipation of any political disturbances that might result in cutting off the supply of rubber.

During the third week, and in fact until the close of the month, trading was very quiet and spot prices irregular. First latex crepe declined to 60½ cents, Smoked sheet, ribbed, to 60 cents, while Up-river fine remained at 61 cents. The closing prices for the month were as follows: Up-river fine, spot, 60 cents; First latex crepe, spot, 60¾ cents; July-September, 58 cents. Smoked sheet ribbed, spot, 61 cents; July-September, 58½ cents. The New York receipts of plantation rubber from Liverpool and London were about 5,250 tons in April against 5,115 tons in March and 4,300 tons in February.

While it is not expected that very much rubber will arrive in New York unsold, provision has been made whereby the unsold rubber may be warehoused. The Rubber Club of America has agreed to handle and release such shipments on the signing of the usual guarantees. A minimum charge of 25 cents per case will be made for this service. The owner of the rubber, however, must pay the customary warehouse, cartage, insurance and other charges.

Arrangements have been made for releasing plantation rubber imports received at San Francisco. The same form of guarantee is demanded from both the importer and manufacturer, and all shipments must be cleared through the British consul. The following rubber manufacturers are bonded in London and consequently do not require guarantees with the Rubber Club of America, Inc.: General Rubber Co., The B. F. Goodrich Co., Goodyear Tire & Rubber Co., Hood Rubber Co. and Michelin Tire Co.

RUBBER AFOAT

Rubber cargoes afloat from London to New York will arrive on the steamships "Largo Law" and "Monadanock." The Booth line steamer "Stephen" from Para and Manaus was due in New York, May 28, with 520 tons. Shipments direct from the Far East are continuing in number. There are now en route from Colombo to New York six steamships that are carrying rubber. From Singapore there are four steamships, and from Batavia there are two, all of which are due to arrive in New York some time during this month.

THE LONDON MARKET.

During the early part of May, while there was considerable activity in futures, there were comparatively few large buying orders for immediate delivery. The market grew firmer, however, towards the end of the first week, Standard crepe selling at 2s. 3d., Smoked sheet at 2s. 3½d., and Hard Para at 2s. 6d. Unusually large consignments arrived at this port, including 1500 tons on the steamship "Lacón." Future shipments were somewhat slow because of continued delay in securing permits.

Prices advanced a little towards the middle of the month, advancing 1½d. for Standard crepe and 1¼d. for Smoked sheet, while the Hard Para rose ½d. The reason for the advance was

the larger orders from America together with the resumption of shipments to Russia, via Archangel. Stocks at London increased a little during the month of April. At the end of March they stood at 6,874 tons. The receipts for the month were 6,016 tons, the deliveries 5,705 tons, leaving stocks at the end of April amounting to 7,185 tons. Some of the rubber that has been going to America would under normal conditions have been shipped to Germany and Austria-Hungary; these two countries having imported 6,000 tons during the first three months of 1914. Brazilian sorts have ruled firmer during the month owing to the comparatively small receipts at Para and Manaus.

During the last week of the month there was some further hardening of prices in this market, Standard crepe selling at 2s. 5d., Smoked sheet at 2s. 5½d., while Hard Fine Para still remained at 2s. 6½d.

SINGAPORE AND COLOMBO

At the weekly auction held at Colombo, April 10, there was a good demand for all grades. About 170 tons were offered. At the earlier auctions held March 15 and 16, 175 tons were offered.

The weekly auction held at Singapore, March 16, resulted in the sale of 150 tons out of an offering of 210 tons, Standard crepe bringing 2s. 4½d. to 2s. 5½d. At the auction of March 30, 105 tons changed hands.

BATAVIA, JAVA.

The first rubber auction was held March 26, and there were 40 tons of rubber sold. Fair prices were realized, and hereafter weekly auctions will be held. There was received in New York direct from Batavia in March 338 tons of rubber, and in April 392 tons, while shipments are continuing to arrive.

NEW YORK QUOTATIONS.

Following are the quotations at New York one year ago, one month ago, and May 29, the current date:

	PARA.	June 1, '14.	May 1, '14.	May 29, '15.
Upriver, fine, new		\$0.70a71	\$0.60	a \$0.61
Islands, fine, new		61a63	53	a 52
Islands, fine, old		63a64	...	...
Upriver, coarse, new		42a43	46	a 46
Islands, coarse, new		29a30	30	a 28½a
Cameta		32a33	34	a 32
Cancho, upper		42a43	48	a 47½a
Cancho, lower		...	45	a 44½a

PLANTATION HEVEA.

Smoke sheet ribbed	57a59	1 Spot 59	a 61
		1 Afloat 58	a 61
First latex crepe	57a59	1 Spot 58½	a 60½a
		1 Afloat 57	a 60½a
Fine sheets and biscuits un-smoked	55a57	...	...

CENTRAIS.

Corinto	...	46	a 46
Esmeralda, sausage	43a44	45	a 45
Guayaquil, strip	...	...	...
Nicaragua, scrap	42a43	44	a 44
Panama	...	...	...
Mexican plantation, sheet	43a46	...	...
Mexican, scrap	40a42	46	a 46
Manicoba, scrap	...	37½a	37
Mangabeira, sheet	40a42	37½a	38
Guayule	...	28	a 29
Balata, sheet	64a65	55	a 55
Balata, block	46a49	48	a 45

[illegible]

May 1. By the <i>Capitula</i> —London:	
G. A. Wilson & Co., Inc.	105,000
Robert Badenhop	17,000
Various	33,500
May 1. By the <i>St. James</i> —Liverpool:	
Arnold & Zeiss	97,000
Rubber Trading Co., Inc.	19,000
General Rubber Co.	6,000
May 13. By the <i>Capitula</i> —London:	
W. H. Stiles	45,000
Robert Badenhop	67,000
Edward Maurer Co., Inc.	28,000
May 14. By the <i>St. James</i> —Liverpool:	
Edward Maurer Co., Inc.	11,200

EAST INDIAN.

[*Denotes plantation rubber.]

April 26. By the <i>Centra</i> —Colombo:	
Meyer & Brown	57,000
General Rubber Co.	27,000
L. Littlejohn & Co.	110,000
April 26. By the <i>Kandian</i> —Colombo:	
Meyer & Brown	55,000
General Rubber Co.	180,000
L. Littlejohn & Co.	155,000
April 27. By the <i>St. James</i> —London:	
Meyer & Brown	60,000
Arnold & Zeiss	200,000
General Rubber Co.	435,000
Rubber Trading Co.	35,000
Robert Badenhop	13,500
Chas. T. Wilson Co., Inc.	195,000
Edward Maurer Co., Inc.	160,000
L. Blitz	35,000
Rumsey & Greutert Co., Inc.	11,200
Rubber Trading Co.	33,500
L. Littlejohn & Co.	40,000
Aldens' Successors, Ltd.	2,500
Johnstone, Whitworth & Co.	270,000
W. R. Grace & Co.	2,200
Various	175,000
April 30.—By the <i>Norina</i> —London:	
Meyer & Brown	107,000
Arnold & Zeiss	125,000
May 3. By the <i>Pratichina</i> —Liverpool:	
Robert Badenhop	11,200
Various	4,500
May 3.—By the <i>Norina</i> —London:	
Goodyear Tire & Rubber Co.	33,500
Chas. T. Wilson Co., Inc.	75,000
Robert Badenhop	115,000
Hood Rubber Co.	45,000
May 7. By the <i>Indrakula</i> —Singapore:	
Goodyear Tire & Rubber Co.	250,000
The B. F. Goodrich Co.	290,000
Chas. T. Wilson Co., Inc.	45,000
Hood Rubber Co.	70,000
General Rubber Co.	225,000
L. F. Johnstone & Co.	95,000
L. Littlejohn & Co.	70,000
Edward Maurer Co., Inc.	11,200
Henderson & Korn	230,000
Aldens' Successors, Ltd.	94,000
Various	6,000
May 8. By the <i>St. James</i> —London:	
Meyer & Brown	112,000
General Rubber Co.	462,000
Arnold & Zeiss	210,000
Robert & Co.	105,000
Edward Maurer Co., Inc.	185,000
L. Littlejohn & Co.	215,000
Henderson & Korn	90,000
The B. F. Goodrich Co.	67,000
W. R. Grace & Co.	67,000
Aldens' Successors, Ltd.	15,000
Rubber Trading Co.	30,000
L. Blitz	70,000
May 8. By the <i>St. James</i> —Colombo:	
Meyer & Brown	115,000
General Rubber Co.	575,000
J. T. Johnstone & Co.	140,000
L. Littlejohn & Co.	200,000
Various	110,000
May 10. By the <i>St. James</i> —Liverpool:	
Adolph Hirsch & Co.	7,000
May 12. By the <i>St. James</i> —Liverpool:	
Arnold & Zeiss	8,600
May 12. By the <i>St. James</i> —London:	
Meyer & Brown	67,000
The B. F. Goodrich Co.	170,000
Goodyear Tire & Rubber Co.	75,000
Michelin Tire Co.	4,000
General Rubber Co.	900,000
Edward Maurer Co., Inc.	45,000

AFRICANS.

May 1. By the <i>St. James</i> —Liverpool:	
Chas. T. Wilson Co., Inc.	1,500
April 2. By the <i>St. James</i> —Liverpool:	
Henderson & Korn	11,200
April 2. By the <i>St. James</i> —London:	
Robert Badenhop	7,000
W. H. Stiles	4,200
May 1. By the <i>St. James</i> —Liverpool:	
Aldens' Successors, Ltd.	7,000
L. F. Johnstone & Co.	4,500
May 1. By the <i>St. James</i> —Liverpool:	
L. F. Johnstone & Co.	11,200

Chas. T. Wilson Co., Inc.	60,000
Hood Rubber Co.	17,000
Robert Badenhop	33,500
Various	16,000
May 14. By the <i>St. James</i> —London:	
Meyer & Brown	40,000
Arnold & Zeiss	415,000
J. T. Johnstone & Co.	330,000
W. R. Grace & Co.	33,500
The B. F. Goodrich Co.	190,000
L. Littlejohn & Co.	470,000
Rubber Trading Co.	10,000
Edward Maurer Co., Inc.	39,000
Henderson & Korn	120,000
L. Blitz	11,200
May 18. By the <i>Orduna</i> —Liverpool:	
The B. F. Goodrich Co.	11,200
May 17. By the <i>Glenburn</i> —London:	
Meyer & Brown	142,000
Aldens' Successors, Ltd.	2,500
L. Blitz	45,000
Robert & Co.	50,000
Michelin Tire Co.	100,000
Edward Maurer Co., Inc.	50,000
Henderson & Korn	100,000
J. T. Johnstone & Co.	22,500
General Rubber Co.	125,000
Arnold & Zeiss	112,000
Rubber Trading Co.	60,000
Robert Badenhop	40,000
Hood Rubber Co.	35,000
Chas. T. Wilson Co., Inc.	112,000
L. Littlejohn & Co.	170,000
Various	22,000
May 19. By the <i>Mannichula</i> —London:	
Meyer & Brown	185,000
Edward Maurer Co., Inc.	45,000
Michelin Tire Co.	125,000
Hood Rubber Co.	25,000
Chas. T. Wilson Co., Inc.	115,000
Goodyear Tire & Rubber Co.	110,000
Various	20,000
May 24.—By the <i>New York</i> —Liverpool:	
Goodyear Tire & Rubber Co.	12,500
May 24.—By the <i>Tokushima Maru</i> —London:	
Goodyear Tire & Rubber Co.	40,000
Arnold & Zeiss	35,000
J. T. Johnstone & Co.	22,500
May 24. —By the <i>Lenox</i> —Singapore:	
General Rubber Co.	290,000
Henderson & Korn	90,000
The B. F. Goodrich Co.	60,000
Chas. T. Wilson Co., Inc.	56,000
J. T. Johnstone & Co.	30,000
L. Littlejohn & Co.	11,200

CUSTOM HOUSE STATISTICS.

PORT OF BOSTON—APRIL, 1915.		
Imports:	Pounds.	Value.
India rubber	25,237	\$11,180
Gutta percha	58,050	6,862
Gutta plantina (Pontianak)	909,571	57,138
Rubber scrap	24,414	2,121
Exports:		
Rubber scrap	18,402	\$2,568
PORT OF CLEVELAND—APRIL, 1915.		
Imports:		
India rubber	104,454	\$59,563
Rubber scrap	27,412	2,673
PORT OF DETROIT—APRIL, 1915.		
Imports:		
Rubber scrap	9,571	\$672
Rubber reclaimed	47,073	4,632
PORT OF NEW ORLEANS—APRIL, 1915.		
Imports:		
Rubber scrap	57,056	\$34,365
PORT OF NIAGARA FALLS—APRIL, 1915.		
Imports:		
India rubber	29,266	\$18,958
Exports:		
India rubber	50,235	\$25,674
Guayule	2,160	626
PORT OF PHILADELPHIA—APRIL, 1915.		
Imports:		
Rubber scrap	9,046	\$723
Exports:		
Rubber scrap	2,305	255
PORT OF SAN FRANCISCO—APRIL, 1915.		
Imports:		
India rubber	15,692	\$9,688

Plantation Rubber From the Far East.**INDICES OF CLONED GROWN RUBBER**

Country	1914	1915
Great Britain	4,214,688	7,403,944
United States	1,506,384	1,748,084
Belgium	1,529,321	
Germany	1,276,665	
Japan	111,253	119,882
Russia	98,482	137,259
France	60,336	35,840
Straits Settlements	35,815	78,999
Australia	20,100	43,486
India	500	500
Canada and Newfoundland		340,140

Total 8,123,655 9,965,075

(Same period 1913, 5,692,636 pounds; same period 1912, 3,109,446)

The following table shows the quantity of rubber imported into the United States from the various countries of the Far East during the first five months of 1915, compared with the same period of 1914 and 1913.

Country	1914	1915	1913
Great Britain	1,214,688	2,403,944	1,214,688
United States	1,506,384	1,748,084	1,506,384
Belgium	1,529,321		1,529,321
Germany	1,276,665		1,276,665
Japan	111,253	119,882	111,253
Russia	98,482	137,259	98,482
France	60,336	35,840	60,336
Straits Settlements	35,815	78,999	35,815
Australia	20,100	43,486	20,100
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Australia	20,100	43,486	20,100
India	500	500	500
Canada and Newfoundland		340,140	

THE RUBBER SCRAP MARKET.

The New York market for rubber scrap is showing a steady decline in prices. The market for May 1915 was particularly weak, with prices for standard mixed tires falling to 5 cents per pound, while special tires were selling for 7 cents per pound. The market for May 1915 was particularly weak, with prices for standard mixed tires falling to 5 cents per pound, while special tires were selling for 7 cents per pound. The market for May 1915 was particularly weak, with prices for standard mixed tires falling to 5 cents per pound, while special tires were selling for 7 cents per pound.

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THE MARKET FOR COTTON AND COTTON FABRICS.

The market for cotton and cotton fabrics is showing a steady decline in prices. The market for May 1915 was particularly weak, with prices for standard mixed tires falling to 5 cents per pound, while special tires were selling for 7 cents per pound. The market for May 1915 was particularly weak, with prices for standard mixed tires falling to 5 cents per pound, while special tires were selling for 7 cents per pound.

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JUNE 1, 1915.

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The Manhattan Rubber Manufacturing Co., which manufactures mechanical rubber goods, with factories, warehouses and executive offices at Passaic, New Jersey, has moved its New York branch office from 18 Vesey street to the new Equitable building at 120 Broadway.

L. Littlejohn & Co., crude rubber brokers, have moved to better and more commodious quarters. Their address is now 138 Front street, New York City.

The Endless Rubber Co., of Ashland, Ohio, has added two new buildings to its plant. One of these, 60x200 feet, two stories high, is equipped with 600 lockers, also toilets and shower baths, for the use of employees. The other, 60x90 feet, is to be used as a mill and calender experimental department, with its second story devoted to hand finishing.

BATAVIA RUBBER MARKET.

BEFORE the European war broke out practically all the crude rubber produced in the Dutch East Indies was forwarded to Amsterdam, Holland, to be there sold and re-shipped. But the war placed so many difficulties in the way of shipping that it soon became almost impossible to get the crude rubber to Amsterdam, and the rubber market of that city is now practically closed. To dispose of their product, the rubber producers of the Dutch East Indies formed the Batavia Association for the Rubber Trade, which association, in turn, organized the Batavia Rubber Market, using the Amsterdam market as a model. The Batavia Association for the Rubber Trade is registered in Batavia and is formed for a term of 25 years beginning March 1, 1915, its object being to further and protect the rubber trade. According to the regulations for trading in rubber on the Batavia market, which were framed and recently published by the Batavia Association, rubber is now sold in Batavia by private sale, by public auction and by forward contract. Buyers must be houses established or represented in the Netherlands Indies, or crude rubber brokers connected with the Batavia Association. Prices are computed in Dutch cents and half cents per metric pound or one-half kilogram, and terms are cash, without discount, sellers always having the right to demand payment per scale. Delivery is taken, in private auction, within 14 days at the latest, unless the parties have otherwise agreed, and the goods are stored pending delivery. The same rule applies to public auction sales. In case of forward sale, delivery is taken on first warning of the sellers, under condition that they give opportunity for inspection. In case of parcels damaged by sea, fire or water, delivery is taken as per conditions of sale. When a buyer fails to take delivery at the proper time the seller has the right to weigh the goods, and from that moment they become the property of the purchaser at his account and risk. Rubber is weighed in gross for account of sellers and the tare afterwards deducted. Delivery is made on the scale.

Monthly auctions are held as arranged by the Batavia Association, according to a plan determined on by the Board of this association in conjunction with the brokers, and notice of the auction is given seven days in advance of the date fixed. Tenders are lodged in closed envelopes stating the names of the brokers connected with the association through which the bidder wishes to buy. Prices paid are kept secret until all bids of the date have been dealt with.

Sellers pay a total commission of $\frac{1}{2}$ per cent. to the purchasing broker. The same rules apply both for private and public auctions.

The association stipulates the forms of contract for sale made by forward contract. Other forms of sale are allowed, as long as they do not deviate from the general rules of the Batavia Rubber Market. Sales under the official conditions of other markets are also allowed. The Board of the association decides all cases not provided for in the market regulations.

The Batavia association has also organized a Rubber Arbitration Bureau to decide, at the request of the parties concerned, any disputes which under the law may be settled by arbitration. This bureau is also to decide upon differences in quality, and upon defaults in carrying out contracts for future delivery, and is to fix allowance when necessary.

RUBBER TRADE INQUIRY.

[107.] A reader of THE INDIA RUBBER WORLD requests assistance in locating the American representatives of the firm of Schirm, of Leipzig, Germany, which manufactures a dipping apparatus for use in the production of transparent rubber nipples.

our products not as good as
 it to be? Probably I can
 how to make them right.
 anyway.

RICK J. MAYWALD, F.C.S.
CONSULTING CHEMIST
 'Phone, 823 John New York

BUYERS' DIRECTORY
PAGE 73

HARRY M. HOPE
ENGINEER

141 MILK STREET BOSTON
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Edited by **HENRY C. PEARSON**—Offices, No. 25 West 45th Street, NEW YORK.

Vol. LII. No. 4.

JULY 1, 1915.

35 CENTS.

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Published on the 1st of each Month by

THE INDIA RUBBER PUBLISHING CO.

No. 25 West 45th Street, New York.

CABLE ADDRESS: IRWORLD, NEW YORK.

HENRY C. PEARSON, Editor

Vol. 52.

JULY 1, 1915.

No. 4

SUBSCRIPTIONS: \$3.00 per year, \$1.75 for six months, postpaid, for the United States and dependencies and Mexico. To the Dominion of Canada and all other countries, \$3.50 (or equivalent funds) per year, postpaid.

ADVERTISING: Rates will be made known on application.

REMITTANCES: Should always be made by bank draft or Postoffice or Express money order on New York, payable to THE INDIA RUBBER PUBLISHING COMPANY. Remittances for foreign subscriptions should be sent by International Postal Order, payable as above.

DISCONTINUANCES: Yearly orders for subscriptions and advertising are regarded as permanent, and after the first twelve months they will be discontinued only at the request of the subscriber or advertiser. Bills are rendered promptly at the beginning of each period, and thereby our patrons have due notice of continuance.

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Entered at the New York postoffice as mail matter of the second class.

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RUBBER MEN FOR PREPAREDNESS.

NO one in the United States wants war. As a nation, we no more desire war than we desire earthquakes or the bubonic plague. And that is the reason why many well-balanced people urge that we get so ready for war that no one will feel at all disposed to start one with us. It is quite widely believed that at the present time we are rather remote from such a condition, and hence the universal chorus—barring the ex-Secretary of State and a few of his friends—for preparedness.

The first practical suggestions for general national defense contributed from any industrial quarter have come from large rubber companies, several of which have recently voted to encourage enlistment in the National Guard, on the part of their factory workmen, to give full pay to any who shall enlist, during the time they are engaged in their military duties, and not to deduct this time from their usual vacations.

It is probably safe to say that there are 75,000 rubber workers of military age—a very substantial body from which the militia of the Eastern and Middle States—where most of the rubber mills are located—may be recruited. This willingness of the rubber companies to finance the patriotism of their employees—if it may be so expressed—is highly important in itself, and especially as an example which is likely to be followed by other

large employers of labor. It may not solve the whole question of national defense, but it certainly is a long step in that direction.

THE WAR AND RUBBER TIRES.

IT seems to be generally believed that there has been a great increase in the sale of American rubber tires abroad since the outbreak of hostilities. This belief is based on the theory that as the motor car has largely supplanted all other means of military transportation alike in the moving of troops and of army supplies, and as no motor car can operate unless adequately tired, there must have been a great demand for both solid and pneumatic tires and of necessity much of this demand must have looked to the United States for its supply.

It is true that the sale of American tires abroad has increased since the beginning of the war, but not to the extent generally supposed. Recent government reports covering our export trade give an accurate idea of the extent of our tire sales abroad. Comparing the ten months ending April 30—which covers the period from the beginning of the war—with the same period of the year earlier, we get the following results: For the ten months ending with last April the value of rubber tires for motor cars sent abroad amounted to \$3,552,651, as compared with \$2,683,344 the year before. To these figures must be added the value of the tires that were sent abroad on cars during that period. For the ten months ending last April the number of commercial vehicles exported was 8,580, as compared with 595 the year before. Assuming the tire equipment to average \$300 a car, the respective tire values for the two periods would be \$2,574,000 for the ten months of war, as compared with \$178,500 for the ten months of peace. The export of passenger cars in the meantime had decreased, being 14,641 for the latter period as compared with 23,167 for the former period. Assuming the tire equipment of these cars to be an average of \$100, and adding these values to those already given above, we have as a total valuation of the tire exports for the ten months ending last April, \$7,590,751, as compared with \$5,178,544 for the ten months ending with April, 1914.

In other words, the total increase of tire exports for the first ten months of the war, compared with the preceding year, measured in value, amounted to only \$2,412,207, an item so small when compared with our total yearly tire production that any one of the larger companies could have taken care of it all without the slightest interference with its general routine.

THE BRIGHTER SIDE OF THE AMAZON.

ALL men who are concerned in a large way with the welfare of the rubber industry feel a profound interest in the country of the Amazon. They have heard with genuine sympathy the stories of distress that have come from that section since rubber began to sell at the

lower levels. Accordingly, they will read with pleasure the letter which appears in a later part of this issue from a correspondent in Manaus, who paints a far brighter picture of that part of the world than we have been accustomed lately to see. He is a man who has been familiar for many years with the rubber industry of the Amazon and speaks from a thorough knowledge of the subject. This note of optimism where of late there has been so much gloom is genuinely cheering.

He admits at once the financial hardships through which that section has been passing, but he states—which is undoubtedly the truth—that the chorus of complaint has been greatly swelled by those who hoped in this way to secure a larger volume of assistance from the federal government. But while one part of the Amazon has been dolorously clamoring for help, there has been another element, consisting of men of a more robust mold, which has accepted the situation as it is, conceded all the discouragements and sought to work out some way of salvation. The first step in this highly needed reform movement has been a candid acknowledgment of the wild wastefulness of the old methods pursued in the non-competitive days, when plantation rivalry was looked upon as an idle dream. These Brazilians who are seeking to rescue the Amazon from the unhappy state in which it has fallen have begun by trimming away the parasites, of which there were many. They have succeeded in getting a substantial reduction in the excessive charges hitherto prevailing in river transportation. They have concentrated their work on the lower sections of the Amazon affluents, where the work can be prosecuted most economically. They have persuaded the *seringueiro* that it is possible for him to work more than a hundred days a year—which was formerly his limit—and they have prevailed upon him to plant his own garden, instead of looking to Manaus and Para for all of his supplies.

The result has been most encouraging. The statistics quoted by our correspondent show that, while the shipment of supplies from Manaus into the rubber-gathering country has materially decreased, the receipts of the best variety of rubber have actually increased. His figures are interesting. The shipments of merchandise from that port to the interior in 1914 were 21,000 tons, or 35 per cent., less than during 1912; but instead of resulting in a material falling off in rubber production, the *Hevea* receipts for the nine months ending with March 31 last showed an increase of 220 tons over those of the same period a year earlier. As viewed by our correspondent, the outlook for the Amazon country is by no means dark. He concludes his letter as follows: "As there is a vast forestal reserve of *Hevea* at hand all over the country—only 5 to 10 per cent. of which is being explored at present—there is no reason why Amazonian production of Upriver Fine should not go on increasing, no matter what the price of plantation rubber will be."

No one who has the rubber industry at heart would want to see South America eliminated as a source of supply. If the Amazon should cease to gather rubber

and any untoward fate befall the Eastern plantations, the manufacturer would surely be in a sad estate. He needs two strings to his bow. Besides, a proper amount of competition is decidedly wholesome. Moreover, to allow the rich rubber resources of the Amazon to fall into neglect would be a churlish flouting of Nature, who has strewn the banks of the great river so liberally with the indispensable *Hevea Brasiliensis*.

TWO PAN-AMERICAN SUGGESTIONS.

THE Pan-American Conference held in Washington late in May was prolific in suggestions, but two of them stand out quite conspicuously—for two totally different reasons; one being "daring and brilliant," as the National City Bank of New York remarks in its June bulletin, while the other must claim distinction solely by reason of its plain, simple, homely common sense.

The first was the suggestion of Secretary Bryan that the United States should issue 3 per cent. bonds to be exchanged for 4 per cent. bonds to be issued by the Central and South American republics; the difference of 1 per cent. in favor of the United States being turned into a sinking fund which, in something like 50 years, would be sufficient to pay up the indebtedness of the southern republics. Here was something quite new, not to say startling, in the ordinarily conservative world of finance.

The other suggestion came from a member of the New York City administration and was to the effect that the exhibits of the southern republics now forming a part of the Panama-Pacific Exposition at San Francisco should on the termination of that enterprise be divided up and sent on a circuit through the larger cities. These two suggestions may properly be mentioned in the same paragraph because they are so totally unlike. The bank bulletin mentioned above goes on to remark of Mr. Bryan's suggestion that "it appeals to the imagination." There is no doubt about that; but financing that appeals to the imagination is not generally the kind that appeals to that prudence and sound judgment on which all permanently successful financing must be based. It is, however, an interesting, not to say piquant, idea that Mr. Bryan has projected into Pan-American discussions and is bound to provoke a deal of comment, especially if the next session of Congress should give it serious consideration.

The second suggestion, for the retention in this country of the South American exhibits and their proper display in one city after another, may be quite commonplace but is eminently sensible and practicable. If a thoroughly

adequate presentation of all the varied resources of the Amazon Valley, including its potentialities in the way of rubber plantations, could be brought before the attention of the American people, and particularly of the leaders in commercial activity, it should certainly result in a great awakening of interest in that most wonderful part of the globe.

THE COLLECTOR ON THE WATCH.

THE attempt to export rubber concealed in other materials, which recently resulted in the conviction and punishment of five men in a New York court, and the dispute over the character of the cargo on the "Lusitania," have determined the Collector of New York to scrutinize all goods delivered to the steamships sailing from that port. This does not mean that he will attempt to examine every case and package—that would require a dozen regiments of inspectors; it simply means that all merchandise delivered on New York docks for export which is of uncertain source or of suspicious aspect will be subjected to a rigid examination. The signal failure of the two attempts to smuggle rubber out of the country—first, concealed in barrels of resin, and in the second place hidden in bales of cotton—is likely to discourage any further ambitions in this direction that sympathizers with any of the belligerents might entertain.

CONSULS TO GIVE SOME GENUINE INFORMATION.

THE value of consular reports in the past has depended largely upon the consul's particular fitness or unfitness for his job. Consular plums have fallen to all sorts and conditions of men. Some have gone to trained newspaper men who have sent home reports full of genuine information. Others have gone to fictionists who have sought consular service for travel and foreign color, whose communications are quite likely to be fair reading but rather lean in valuable commercial facts. Then again, many consular posts—perhaps the greater part of them—have been handed over to plain political hacks without news sense or descriptive faculty, whose reports have neither conveyed information nor excited interest.

But Secretary Redfield hopes to change all this. The Department of Commerce, over which he presides, is preparing blanks for consuls to fill out which will tend to standardize consular reports and will enable our government to secure just the information

that American business men require. It is the intention of the department to prepare a list of questions that shall so thoroughly cover the ground that the manufacturers and exporters of this country can tell at once whether a certain foreign market possesses any interest for them. For instance, a consul will no longer advise the department that a certain merchant in Melbourne wants to purchase American rubber goods, but he will specifically state what goods the merchant wants, the kind and quality and volume, and the price he is willing to pay. This will enable the exporter to make a definite proffer at once without the long delay involved in the interchange of correspondence over a wide distance.

The great extent and marked success of the foreign commerce of England and Germany are attributable in no small measure to the intelligent assistance of these two governments. Washington has always been interested, of course, in the growth of American exports, but this interest hitherto has not invariably assumed a highly efficient form. This new departure of the Department of Commerce is a hopeful sign.

SHALL WE HAVE A UNIVERSITY OF TIRE REPAIRING?

IN a general way educators may be divided into two classes, the culturists and the practicalists. The first cling tenaciously to the Latin and Greek and calculus of the fathers—anything to exercise the mind; while the latter contend that while the mind is about it it might as well exercise itself on something it can use. Those advocates of the useful in education can take profound satisfaction in the schools now being established in different parts of the country to teach the complicated art of tire repairing. Here is education that is practical to the core.

There are, let us say, 10,000,000 tires in use at the present time in this country. Probably 60 per cent. of them, or, roughly, 6,000,000 tires, will need some sort of repairing during the year. Assuming that a competent workman—taking injured tires as they come, mild cases and serious cases together—could comfortably take care of 10 tires a day, or 3,000 in the course of a year, there would be work enough to keep 2,000 repair school graduates constantly busy. That's a very respectable student body—quite equal to that of several of the best known American universities. As these are distinctively days of standardization, why not bring all these ambitious scholars together in an institution of adequate size and ample facilities, situated in some locality where tire consumers consume tires in the greatest volume—near New York, for instance, or Chicago—with power to confer on its graduates the degree of D. P. S.—Doctors of Pneumatic Surgery.

The Rubber Trade in Russia.

Probably the most important duties that will come before the United States Senate at its next session will be the ratification of the new commercial treaty with Russia, to fill the gap left by the abrogation, during the late days of the Taft administration of the former commercial treaties existing between that country and this. Russia has a very respectable foreign trade. It amounted during the first ten months of 1913 to \$1,137,000,000, \$520,855,000 representing imports during that period, and \$592,194,000 representing exports. Both of these figures were somewhat during the last months of 1914, very largely owing to the outbreak of hostilities. But undoubtedly after the cessation of the war Russia's foreign trade will resume its normal volume, the exports may show a falling off for a time, but the imports will doubtless materially increase.

But perhaps more interesting than the volume of Russia's entire foreign commerce are the figures that represent that country's imports from Germany, for naturally a very considerable part of this trade will, for some years to come, at least, go to other nations. In 1913 Russia bought over \$209,000,000 worth of various products from Germany. But while these figures appeal to American manufacturers as a whole, the particular department of Russia's commerce that interests the American rubber manufacturer is the extent of the rubber industry in the Czar's dominion and the field that country offers for the marketing of American goods.

The extent of Russia's rubber trade for the last normal year, 1913, measured in the value of the product, was \$56,000,000. The manufacture of rubber articles had been increasing with considerable rapidity for a number of years. The output of shoes, for instance, had doubled in ten years, and the production of tires had increased rapidly with each year. It is probable that the Russian factories, the two large ones, the Russian-American and the Prowodnik together with the half dozen smaller

including also, in more limited quantities, Norway, Sweden and Denmark, while some shipments were made to China, Australia and South America, particularly Patagonia.

Though the making of automobile tires is a comparatively new industry, exports of these goods were being made at the outbreak of the war to a great many foreign countries, a late pamphlet of the Prowodnik company showing sales offices not only in all the countries of Europe but in New York and San

Francisco, Montreal and Toronto, and in Argentina, Brazil, Egypt, India and South Africa. In addition to shoes and tires Russia enjoyed a very considerable export business in one other article of rubber manufacture, namely, rubber sponges, in the making of which it has particularly excelled.

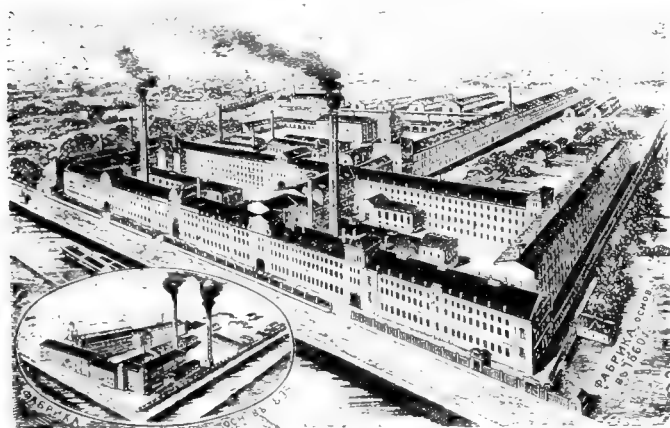


TRADE MARK FOR RUSSIAN-AMERICAN RUBBER SHOES.

The war has had much the same effect on the rubber industry in Russia as in England—that is, it has vastly increased the demand, by reason of government orders, for shoes, surgical appliances and tires, while naturally the output of certain other lines used in ordinary times of peace has been much curtailed. But the chief effect has been the decrease in the normal supply of crude rubber. Late advices indicate that prices of crude rubber in Russia are now 100 per cent. higher than they were last July, while the prices of rubber manufactured goods have risen from 20 to 25 per cent.

Owing to government assistance, and especially to the levying of rather onerous duties on all imports of rubber manufactured goods—duties amounting to \$21.39 per 100 pounds on tires and \$17.11 per 100 pounds on other goods—the Russian companies have been able very largely to monopolize their home trade. Some importations, however, from other countries have been made, chiefly from Germany. The imports of rubber manufactured goods into Russia from the United States have never reached a large figure; the maximum, during the last ten years, expressed in value, was reached in the year 1907-1908, namely, \$26,932. The imports remained about the same for the next six years, in the year 1912-1913 being \$26,909, and in the following year—ending with June 30, 1914—they dropped to \$12,133. It might be said in passing that in all probability Russian imports of United States goods in reality rather exceeded the figures given, for some goods were sent by way of England and Germany and Norway, and were credited to the countries from which they were re-shipped.

Germany, on the other hand, has done quite an export business in rubber goods with Russia for some years, the value of these exports exclusive of crude and waste rubber, gutta percha, balata and substitutes—in 1913 amounting to \$2,337,500. In order to show just what goods America has sold to Russia in the last ten years, a classified table is given; and in order further to show what market the Germans were able to find in Russia



FACTORY OF THE RUSSIAN-AMERICAN INDIA RUBBER CO., "TRIFOLNIK," PETROGRAD, RUSSIA.

ТОВАРИЩЕСТВО РОССИЙСКО-АМЕРИКАНСКОЙ РЕЗИНОВОЙ МАНОФАКТУРЫ

RUSSIAN-AMERICAN INDIA RUBBER CO., TOVARIICHESSTWA, COMPANY, RUSSIAN-AMERICAN; RESINOWOI, MANUFACTURE.

plants are producing not less than 100,000 pairs of rubber shoes annually, and the manufacturers not only enjoyed a practical monopoly in this respect but were building new plants, owing largely to German. But in-

a tabulation is given, in considerable detail, of the German goods imported into Russia in the year 1913, as follows:

EXPORTS OF AMERICAN RUBBER GOODS TO RUSSIA.

FISCAL YEAR ENDING JUNE 30.

	Belting, Packing, and Hose, Value.		Boots and Shoes, Pairs.		Tires, For Auto-mob. Tires, Value.		Other Goods, Value.		Total, Value.	
1904-1905.....	\$1,149		132	\$121					\$1,70	
1905-1906.....	2,093		2,500	8,040				\$4,189	14,322	
1906-1907.....	618		1,557	797				1,174	13,589	
1907-1908.....	11,636		5,257	3,755				11,541	26,931	
1908-1909.....	1,289		1,713	1,231				1,677	23,197	
1909-1910.....	1,934		4,025	2,427				2,806	25,167	
1910-1911.....	6,391		7,249	8,034	\$653		\$764	7,128	23,872	
1911-1912.....	7,023		605	810			108	13,974	24,115	
1912-1913.....	14,801		114	62			4,831	6,486	26,909	
1913-1914.....	7,448		359	279	1,168		522	2,696	12,113	

RUBBER AND RUBBER GOODS EXPORTED BY GERMANY TO RUSSIA DURING 1913.

	Tons.	Value.
Crude rubber.....	532.2	\$680,000
Gutta percha.....	2.3	17,750
Balata.....	4.3	5,500
Rubber waste.....	120.6	61,000
Substitutes.....	16.5	4,750
American cloth.....	11.9	14,750
Rubber collars.....	19.4	35,500
Waterproof cloth.....	1.5	7,750
Dissolved rubber.....	27.3	1,750
Soft rubber, gutta percha paper.....	17.7	26,500
Cut rubber sheets, unvulcanized.....	3.7	10,500
Automobile pneumatics (inner tubes).....	28.2	97,500
Cycle pneumatics (tubes).....	20.3	58,000
Hose.....	15.6	26,000
Belting.....	31.3	37,000
Tarpaulins.....	0.3	50
Rubber thread.....	25.6	94,250
Rubber shoes.....	0.3	500
Solid rubber tires.....	50.2	117,250
Automobile tire casings.....	185.9	490,000
Cycle tire casings.....	50.8	89,000
Rubber sheet, with textile composition.....	186.2	413,750
Bottle rings, etc.....	33.7	22,000
Elastic ribbons.....	37.6	103,500
Printers' sheets.....	0.7	1,000
Rubber for dentistry.....	1.0	7,000
Hard rubber pressed in discs, bars, etc.....	19.8	27,500
Tubes from hard rubber.....	1.0	3,000
Other hard rubber goods.....	86.9	211,750
Surgical instruments.....	108.0	441,500
	1,668.7	\$3,106,500

While our own sales of rubber manufactured goods to Russia have been so small as to be practically negligible, as indicated by the table given above, it cannot be said, on the other hand, that our purchases from Russia have ever reached any considerable figure. Beginning ten years ago with a value of about \$33,000, they dropped steadily for the next five years, being in 1909 - 1910 less than \$8,000. But from that point they have increased with considerable rapidity, reaching for the year ending June 30, 1914, a value close to \$150,000. The brief table which follows shows the value of these imports for each year, all the imports being grouped under the general head of rubber manufactured goods, without any detailed classification. Undoubtedly, however, by far the greater part of these imports during the last two or three years has consisted of tires.

VALUE OF IMPORTS INTO THE UNITED STATES OF RUBBER MANUFACTURES FROM RUSSIA, FISCAL YEAR ENDING JUNE 30.

1904-1905.....	\$2,000	1905-1906.....	\$7,801
1905-1906.....	1,344	1906-1907.....	1,176
1906-1907.....	1,174	1907-1908.....	2,250
1907-1908.....	1,176	1908-1909.....	13,589
1908-1909.....	1,174	1909-1910.....	23,197

It cannot be said that the rubber industry in Russia is a thing of mushroom growth, for as a matter of fact it dates back to the very beginning of rubber manufacture anywhere in the world.



"PROWODNIK" TIRE.

The first rubber mill was built in Russia soon after 1830, which shows that the industry took root in that country at about the same time as in the United States and England. The first factory was opened in St. Petersburg, by Henry Kirstein.

Fourteen years later, in 1844, another factory was built, and by 1845 the combined output of these two factories had reached a value of 90,000 rubles (\$46,350). In the early '50s two more manufacturing companies entered the field, but during the next three or four years the industry appeared to languish, until in 1857 the government, recognizing the importance of rubber manufactures for

the general welfare of the people, put on a protective tariff and encouraged the Russian industry.

In 1860 the Russian-American India Rubber Co., which by the way, had neither Russians nor Americans among its directors or stockholders—all being German—was established in St. Petersburg, and it soon absorbed the smaller companies then in existence. Its chief output—a very natural one, considering climatic conditions in that wintry empire—consisted of rubber

shoes. The production in that year amounted to 220,000 pairs. Ten years later the product had increased to 1,800,000 pairs, and in 1880 it had reached 3,300,000 pairs.

For, notwithstanding the fact that the Russian climate is not particularly favorable to the growth of rubber trees, the industry has



FACTORY OF THE RUSSIAN-FRENCH INDIA-RUBBER GUTTA PERCHA & CO. "PROWODNIK" AT RIGA, RUSSIA.

extending 15 or 20 years. The Russian-American India Rubber Co. has completed the construction of the largest rubber factory in the world, employing nearly 3,000 employees. The production of rubber in Russia is now

parts of the total annual product exceeded \$7,000,000.

An American who visited that plant in 1895 wrote a letter to *The India Rubber World* which appeared in the February number of that year in which he expressed his surprise and admiration at the extent of this great plant. He wrote: "In their plant they have two buildings 1,225 feet long and with right angles with this another one 800 feet long. Each of these is 65 feet wide and four stories high. A very simple calculation shows in these buildings alone a floor space of a little over 19 acres." He then went on to describe various other buildings, such as boiler houses, pumping stations and electric light plants, making all told a group of structures that covered a large area of ground and was most imposing in its size. He was further impressed with the very low wages paid the operatives, on the one hand, and on the other the paternal care with which they were looked after by the management, nurseries being provided for the young children of the women operatives, physicians being in constant attendance upon the employees, with adequate hospital facilities for those who needed unusual care, and a "rest house" for convalescents. Furthermore, there were large caldrons of tea constantly brewing, which was served without stint or limit to all who wanted it. There was, moreover, a pension fund to care for those temporarily incapacitated or who after long years of service had been retired from active work. It might be said in passing, however, that all this attention to the welfare of the employees did not constitute a particularly heavy drain on the resources of the company, because the yearly dividends at that time ran quite uniformly from 50 to 70 per cent.

This company acquired an international reputation many years ago by reason of the liberality with which it exhibited at various world fairs. At the World's Fair held in Chicago in 1893 the most notable foreign exhibit of india rubber was that of the Russian-American company. A series of large showcases displayed a great variety of rubber footwear. Some specimens, quite unknown in America, had fur linings, to meet the colder conditions prevailing in Russia. But in general style and trimness the footwear did not compare favorably with that of American manufacture. This exhibit covered a floor area of about 10,000 square feet and, in addition to the footwear already mentioned, included rubber clothing, belting and hose.

It also had a display at the Paris exposition in 1900 which attracted universal attention. The company's exhibits occupied a large building, or rather, more properly, a pavilion constructed expressly for this purpose. In addition to a fine array of the company's products there was a reproduction of a rubber gatherer's camp in the Amazonian forest, showing the gathering of the latex from the wild trees.



LARGE MACHINERY FOR RUBBER USE

It is not to be assumed, however, that the Russian-American company was permitted to monopolize the field. Other companies entered the domain of rubber manufacture, and conspicuous among them the Prowodnik company, founded at Riga, in 1888. The full name of this company as rendered in English is the Russian-French-India Rubber, Gutta Percha & Telegraph Works, Prowodnik, Riga, and as rendered in French and German, it is longer yet, but it is always referred to simply as the "Prowodnik"—a name used on its trade mark, for which the English synonym is "the leader." This company was chartered with a capital of 700,000 rubles, and began active operations the year after it was chartered. Its business was prosperous from the beginning, and in twenty years its net profits had reached nearly

2,000,000 rubles, or close to \$1,000,000 a year. Its products cover a wide range, including soft rubber and hard rubber goods and articles of gutta percha, besides asbestos and linoleum goods. In rubber, its product ranges through the whole field from tires, clothing and footwear to pencil erasers.

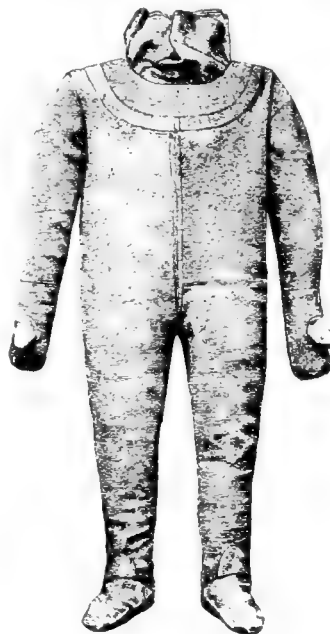
Some conception of the present size of the Prowodnik company may be obtained from its latest statistics. Its paid up capital and reserve amount to £4,230,000; its annual business to £7,000,000; its workmen and officials—according to a late circular—constitute an army of 18,000 people, and its factory is run by engines aggregating 20,000 horse-power.

The Prowodnik company, like the Russian-American company, has always been keenly alive to the welfare of its employees, furnishing them when sick with free medical attendance and free medicines, and supplying them with hospital beds for the more severe cases. Some years ago it built a number of comfortable houses near the factory which are rented to the workmen at a moderate rental.

Like the Russian-American company, also, it has cut something of a figure at international expositions, its display at the Paris exposition of 1900 being particularly notable. It showed there not only the ordinary rubbers familiar to Americans, but rubber footwear in blue, green, yellow and other colors.

This company has established an international reputation for its automobile tires. The English correspondent of this paper included in his letter of December, 1913, the following paragraph: "The Prowodnik motor tire, which is characterized by its peculiar brownish color, appears to be very popular and to be selling well against its rivals, despite the fact that the covers cost about £2 more than those of well-known makes longer established." And it is true of American cities as of English cities, that one does not have to go far to discover cars equipped with these Russian-made tires. The Russian Tyre Sales Co. was incorporated under the laws of New York in July, 1912, for the purpose of distributing these tires, with salesrooms in New York City. This company was succeeded in January, 1914, by the Columb Tyre Import Co., located in the auto. and tire section on upper Broadway.

In the summer of 1908, there was created quite a commotion in the European rubber trade by the report that the Russian

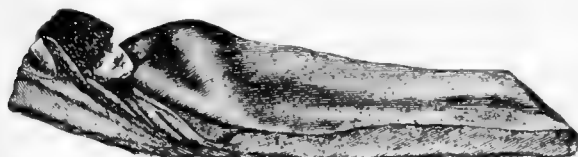


RUSSIAN RUBBER DIVING SUIT.

companies had consolidated through the purchase on the part of the Russian-American Co., of the controlling interest in several smaller companies and half of the capital stock of the Prowodnik company, but it subsequently appeared there was no merger in the sense of lost identity, but simply a merger in the sense of a mutual understanding and a general community of interest, including the Russian-American company, the Prowodnik and two

1906 the volume again exceeded sixteen million pounds, and has since increased quite uniformly, being 20,000,000 pounds in 1912, nearly 29,000,000 pounds in 1913 and 24,000,000 pounds in 1914—notwithstanding the outbreak of the war and the partial shutting off of supplies.

While the importations into the United States of manufactured rubber goods from Russia have never been large, our



SOLDIER'S RUBBER SLEEPING BAG.

smaller concerns, namely—C. Weyerbusch & Co., of Moscow, and the firm of Leopold Neuscheller & Co. The object of this merger was the elimination of wasteful competition.

As far back as 30 years ago the Russians began to find an export market for their shoes. Their shipments to foreign countries amounted in 1888 to 355,000 pairs; in 1895 to 2,700,000 pairs, and a few years later reached 3,222,000 pairs; almost the entire volume, or considerably over 90 per cent., of these exports going to Germany. Possibly this does not seem like a very large figure, but it is very much larger than the volume of American rubber footwear exports in any single year.

The industry, however, was not confined exclusively to shoes, by any means, as by the year 1890 the product of the Russian factories included clothing, hose, packing, belts, and other mechanical goods, surgical rubber goods, sponges, molded goods, toys, insulated wire and other articles in which rubber constitutes a large or a principal part, the machinery for which was obtained partly from England and partly from the United States, the Farrel Foundry & Machine Co., of Ansonia, Connecticut, having been called on for many mixing and other mills for Russian plants.

The manufacture of automobile tires has progressed steadily in Russia during the last ten years. The home consumption of pneumatic tires is not large as compared with America, as the number of automobiles in Russia is still comparatively small, but there has been a constantly increasing demand for solid tires for horse-drawn vehicles, more of these being used in Russia, probably, than anywhere else in the world.

During the last four or five years, and especially since the outbreak of the war, Russia has devoted quite a little energy to the construction of dirigibles and aeroplanes. The Russian government owned fourteen dirigibles at the time the Germans started to invade its borders. Early in September last the war department announced that it had decided to order additional dirigibles and over 300 aeroplanes. The larger part of this order had to be filled outside of the country, but some of the balloons and a number of the aeroplanes have been constructed in Russia.

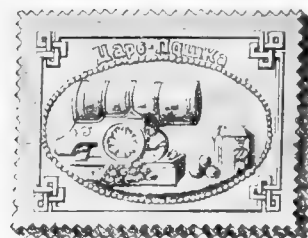
In a general way it may be stated that the growth of the rubber industry in Russia during the last twenty-five years has shown a constant increase. In 1891 Russia consumed ten million pounds of rubber; in 1898 the volume had increased to sixteen million pounds, valued at six million dollars. During the next two years there was something of a recession in the volume consumed, although the value rose to ten million dollars, but by



HARD RUBBER INK WELL.



RUBBER COVERED KNAPSACK.



RUBBER ERASER.

importation of rubber scrap has been of considerable volume for many years. The following table shows the amount and value of these importations during the last ten years:

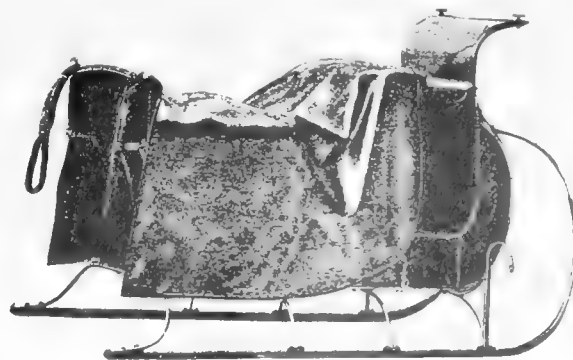
IMPORTS OF RUBBER SCRAP INTO THE UNITED STATES FROM RUSSIA.

	Pounds.	Value.
1904-1905.....	6,788,582	\$401,843
1905-1906.....	7,891,040	485,942
1906-1907.....	7,766,304	678,462
1907-1908.....	4,694,731	427,662
1908-1909.....	3,299,367	274,864
1909-1910.....	8,880,562	792,438
1910-1911.....	7,119,625	638,367
1911-1912.....	5,220,921	404,159
1912-1913.....	7,468,274	619,594
1913-1914.....	5,018,555	453,522

Both the large Russian rubber companies, the Russian-American at St. Petersburg and the Prowodnik at Riga, have adequate equipments for reclaiming rubber. As far back as 1899 the Russian-American company sent the Birmingham Iron Foundry, of Derby, Connecticut, an order for reclaiming ma-



NURSE'S RUBBER APRON.



RUBBER LATHE.

chinery amounting to 100 tons in weight, including grinders, sheeters, crackers, vulcanizers and blowers, while the Prowodnik plant is capable of producing from 40 to 50 tons of reclaimed rubber a day.

What the Rubber Chemists Are Doing.

ANALYSIS—SOME RECENT METHODS FOR THE DETERMINATION OF TOTAL SULPHUR IN RUBBER. Under this title in "Technologic Papers of the Bureau of Standards, No. 45," J. B. Tuttle and A. Isaacs review and compare the various methods for the determination of total sulphur as given by well-known rubber chemists, discussing the results and outlining the method adopted by the Bureau of Standards. Eight methods were compared. Of these two were by direct solution, three were by direct fusion, two by solution and subsequent fusion and one special method by acetone extraction. The tabulation of the results obtained by these methods shows remarkably uniform determinations by the method of Waters and Tuttle and justify its selection as the preferable method.

The treatment in detail was as follows: The rubber (0.5 gram) was treated in a porcelain crucible with 25 c.c. of concentrated nitric acid saturated with bromine, the vessel covered with a watch glass and allowed to stand one hour. It was heated on a steam bath for one hour and then the cover was removed and the solution evaporated to dryness. The residue was fused with 5 grams of fusion mixture (sodium carbonate and potassium nitrate), extracted with hot water, filtered, the filtrate acidified with hydrochloric acid and the sulphur precipitated as usual.

The authors state as the summary of their investigation the following:

It is shown that the methods which have been proposed for the determination of the total sulphur, other than that present as insoluble metallic sulphates, are not satisfactory.

It is shown that loss of sulphur is likely to occur in the direct fusion methods, and this loss is apt to increase with increasing free-sulphur content. The method of Waters and Tuttle is recommended for the determination of total sulphur. This method is accurate and comparatively rapid and has given satisfactory results in the hands of a number of analysts over a rather extended period of time.

A new suggestion is offered, namely, to determine separately the free sulphur and the sulphur remaining after the acetone extraction, reporting the sum of the two quantities as the total sulphur. This procedure eliminates the troublesome effect of the free sulphur upon the determination of the total sulphur.

ANALYSIS AND EVALUATION OF RUBBER. Philip Schidrowitz, Ph. D., in the "Analyst," May, 1915, publishes a comprehensive paper, with copious references to original sources, under the title of "Recent Advances in the Analysis and Evaluation of Rubber and Rubber Goods." The leading features of the paper are as follows:

I. CRUDE RUBBER.

The examination may involve:

(a) Chemical analysis, with a view to determining the quantity of pure rubber and of various impurities, and, to a certain extent, in some instances, the nature of the latter.

(b) Physical or mechanical tests, carried out either on the crude material or on the latter modified by the vulcanizing process, with a view to determining the physical and mechanical qualities of the rubber substance.

Chemical analysis has hitherto been subordinate in the commercial evaluation of rubber, partly on account of lack of exact knowledge regarding the nature of the secondary products (resins, nitrogenous substances, etc.), and partly owing to the absence of specific information on the influence exercised by them on the vulcanization process on the one hand, and on the more important attributes (strength, elasticity, etc.) on the other hand.

If the different substances and with the chemical investigation of the nature and influence of the "impurities" necessarily make

progress in this direction slow, it is not surprising that work having as its object the identification and evaluation by chemical means of different rubber substances or caoutchoucs is still in a more or less embryonic state.

Recent work by Caspari suggests the possibility of discriminating, up to a point, by physico-chemical methods, between caoutchoucs of different commercial quality. According to Caspari, rubber is of a composite character and consists of (1) "soluble" rubber, which is a weak but elastic colloid, soluble in light petroleum, and (2) of "insoluble" or "pectous" rubber, which is an elastic colloid of considerable mechanical strength. The latter, in some respects resembling a slightly vulcanized material, preserves its structure on contact with solvents. It is, however, gradually dissolved by benzene and carbon tetrachloride, but whereas the viscosities of the soluble in Brazilian and plantation Para, respectively, are very similar, the "pectous" in the latter is far more readily attacked by benzene or carbon tetrachloride than the "pectous" of the former. According to Caspari, Brazilian fine contains 35 to 50 per cent. of "pectous," whereas plantation rubber examined by him showed no more than 10 to 25 per cent. Caspari believes that "nerve" or strength is mainly due to the "pectous" variety. The work of Caspari will require confirmation and amplification before it is applied to rubber evaluation. It suggests a new field of research indicating the possibility of estimating the quality by a direct physico-chemical method.

SECONDARY PRODUCTS—RUBBER RESINS. The outstanding feature of the work of Heinrichsen and Marcusson is that all resins excepting that from Para (*Hevea*) are optically active. In certain cases, therefore, the absence of optical activity in the extracted resin may be taken as evidence that no rubber other than *Hevea* is present. Para resin contains 15 per cent. and other resins up to 100 per cent. of unsaponifiable matter. The optical activity appears to be mainly due to the latter. Iodine values varying from 30.6 for Jelutong resin to 118 for Para resin were found. So far as the investigation has been carried it appears that the resins from vulcanized rubber exhibit the same characteristics as those from the crude material. D. Bloom, as the result of the examination of 150 samples of resin from different species, concluded that the "acid value" of the resin from the same species is constant.

The effect of rubber resin on vulcanizing capacity is a matter of controversy. Litharge has been shown to be practically inoperative as a catalyst in the absence of rubber resins. Where litharge or other catalyst was not employed it has been found that the rubber resins do not exercise any marked effect on the curing capacity.

MECHANICAL IMPURITIES. Beadle and Stevens give the following method (for these materials only). They "depolymerize" the rubber by heating with a solvent of high boiling point, thinning still further with a solvent of low viscosity, filtering and weighing.

INSOLUBLE MATTER—NITROGENOUS SUBSTANCES. This item does not apply to accidental mechanical impurities, but to natural and normal substances always present to some extent in crude rubber. While there is no proof that normal "insoluble" is essentially a nitrogen product (a part doubtless consisting of oxidation products) it is fairly certain that it normally contains a high proportion of nitrogen.

METHODS OF SEPARATION AND ESTIMATION. In W. Schmitz's method 2.5 grams rubber are treated with 50 c.c. of pentachloroethane for 5 to 7 hours at 85 to 90 degs. C. with the formation of very fluid solution readily filterable, particularly if somewhat diluted with chloroform. The residue can be further purified by dissolving in 5 per cent. solution of sodium hydroxide and reprecipitating with hydrochloric acid.

PRACTICAL CONSIDERATIONS. There is considerable evidence to warrant the assumption that the "insoluble" matter in crude rubber has an important bearing on vulcanizing capacity, but no quantitative relation has been discovered. While it has been shown that the removal of the "insoluble" markedly decreases curing capacity, the experience of the author is that rubbers with low proportions of "insoluble" do not necessarily cure badly, nor do samples with high "insoluble" necessarily cure rapidly. Probably "insoluble" varies so in composition that further methods of separation must be devised before "insoluble" can be taken as a criterion of quality. The author prefers the indirect method for determining "insoluble," which consists in evaporating a convenient volume of clear solution, obtained by treating 0.5 to 1 gram of rubber with 100 to 200 c.c. benzene in a tall cylinder, allowing to settle and weighing the residue in a pipetted portion drawn off from above the residue.

ESTIMATION OF RUBBER. Assuming a satisfactory method of separating the "insoluble" matter, the most satisfactory indirect method of estimating rubber is by deducting the sum of moisture plus resin plus "insoluble" from 100. This method involves the assumption that the whole of the ash and nitrogen are present in insoluble form. The author recommends the return of the analysis in the following form:

Moisture	Per cent.
Resin (acetone extract)	"
Insoluble matter	"
Rubber (difference)	"
The above contains:	
Ash (mineral matter)	"
Nitrogen	"
Nitrogen = protein	"

These notes apply only to routine technical analysis of which the chief object is to ascertain whether a distinct abnormality is disclosed and to control methods of production or of gauging suitability for specific manufacturing purposes.

DIRECT METHOD BY TETRABROMIDE FOR DETERMINING RUBBER. The reader is referred for details of this method to the work by Caspari on "Laboratory Methods for Rubber Analysis."

The reaction of bromine on caoutchouc is $C_{10}H_{16} + 6Br = C_{10}H_{14}Br_4 + 2HBr$.

ESTIMATION OF MOISTURE. The best method is (1) to dry in water oven at 98 degs. C. till an increase in weight becomes apparent or for a standard time of 2 hours, or (2) to take the difference between original weight of sample and weight after acetone extract plus the extract.

WASHING LOSS. It is generally agreed that if the sample is large and requires washing the analytical determination should be carried out on the washed, air-dried material.

PHYSICAL AND MECHANICAL TESTS.

VISCOSITY. A low viscosity almost invariably indicates poor quality. A determination of swelling capacity (per Caspari) may give more satisfactory results.

ADHESIVE TEST. Beadle and Stevens determine the load required to separate pieces of paper evenly coated with a solution of rubber. The paper is coated by drawing it over the surface of a 5 per cent. (or less) solution.

MECHANICAL TESTS. By this is meant tensile tests. These are of no value as applied to raw rubber.

VULCANIZATION TESTS. (a) **MATERIAL.**—State of aggregation (degree of polymerization) or physical condition of the rubber substance, quality and nature of resin, and of "insoluble" matter and acidity.

(b) **PROCESS.**—Temperature, duration of cure, method of heating, quantity of sulphur; and if fillers are used, their nature and quantity. So long as our knowledge of the physical and chemical nature of the impurities and of the rubber substance is incomplete it is impossible to devise any method of analysis or physical test which will enable us to determine quantitatively the effect of

the various factors on vulcanization. Direct vulcanization tests are therefore, for the present, essential for the purpose of practical evaluation.

Broadly stated such may comprise: (a) Observations on material during or rather towards the process.

(b) Observations on the nature of the vulcanized product with regard to "rate of cure," relying on the mechanical properties of the cured stock.

There appears to be no direct connection between the "coefficient of vulcanization" and the technical properties of the material. Various types of tensile tests have been devised and are applied to vulcanized rubber. There is an essential difference between tests for the comparative evaluation of crude rubber and tests applied with the view of examining the specific properties of any given rubber article. With regard to the former it is desirable to use methods calculated to measure certain intrinsic and typical properties of the raw material, such as curing capacity, strength, distensibility and capacity for recovering.

Any system of evaluation based on factors influencing the vulcanization process must be carried out under standardized conditions of mixture, cure and test. Pure rubber and sulphur are considered the best because most uniform and also because a filler renders the reaction less delicate.

II. VULCANIZED RUBBER.

PREPARATION FOR ANALYSIS. This is accomplished by grinding the sample to a fine powder by a pair of steel or iron rolls.

GENERAL SCHEME OF ANALYSIS. A preliminary qualitative test is made with cold benzene or nitro-benzene. If the solvent does not become appreciably colored (yellow or brown) or fluorescent no considerable amount of bitumen has been used. Such materials vulcanize to a certain extent and may become more or less insoluble in consequence. If qualitative tests give positive results the method of analysis must be selected. For the separation of minerals, starch, fibers, etc., high boiling point petroleum should be employed as a solvent.

PATENTED TREATMENT OF RUBBER.

ELASTIC AND PLASTIC SUBSTITUTE FOR RUBBER. J. Stockhausen, German patent No. 280,144, elastic and plastic masses are obtained from glycerol-gelatin solutions by the addition of artificial resins from phenol and $HCHOH$ glycerol-gelatine, especially the camphor-glycerol-gelatine masses obtained according to German patent, No. 277,653. The products are applicable in the manufacture of water hose. For example, gelatin, 2.5 kilos, is dissolved in glycerol, 2.5 kilos, and then intimately mixed with 0.5 to 1 kilo of camphor in acetone, 2 to 4 kilos shredded asbestos, 0.3 to 1 kilo sulphur, 0.5 kilo Frankfurter black, and 1 to 1.5 kilos phenol-resin; whereupon the mass is hardened and worked further according to the known methods. [Presumably this would be mastication on ordinary rubber warming mill, in preparation for feeding to a tubing machine for formation of hose tubes, etc.]

SPONGE RUBBER. Philip Schidrowitz and H. A. Goldborough, British patent, No. 1,111 (1914). This is an interesting new departure in the manufacture of sponge rubber. The usual processes for producing foamy or cellular rubber are based substantially on the principle of adding to the ordinary plastic rubber mixing, volatile or gas-forming substances, which, on the application of heat, give rise to a porous or cellular formation in the mass by their effort to escape.

The improved process of making rubber sponge is simple and economical, being carried out directly on the rubber latex. The method consists in first coagulating the latex under conditions producing a porous or spongy coagulum and then fixing the cellular structure so produced by vulcanization in a wet state. The amount and nature of the coagulant used depends on the nature and condition of the latex and character of product desired.

In the case of *Hevea* latex, acetic acid, other suitable acid or

acid salts may be used, with or without dilution of latex or without heat prior to vulcanization. In *Funtumia* latex, or a preserved latex coagulable by heat, heat alone will suffice. Carbon bisulphide, benzine, acetone or alcohol, or a mixture of the latter, may be employed with or without heat. The addition to the latex of gas-producing substances, such as carbonates or sulphides, modifies or increases the sponge formation if the coagulation takes place in presence of an alkaline medium such as ammonia. For vulcanization, sulphur, as such, or suitable sulphur compound which will liberate sulphur may be used. The vulcanizing agent is added either before or during incipient coagulation, and the mass may be directly vulcanized by subjecting it to vulcanizing temperatures, either in open steam or hot air or under water. The process permits the addition of fibrous substances, fillers, pigments, dyes or accelerating agents. The patentees give ten different examples, showing the application of their process.

One of these, however, will be sufficient by way of illustration. Equal quantities, by volume, of latex and of a saturated solution of ammonium carbonate mixed together are heated on a water bath and one per cent., by weight, of finely divided sulphur stirred in. Coagulation may be induced by adding a sufficiency of acetic acid while stirring the mixture. The containing vessel is then placed in a steam vulcanizer and cured about one hour at 286° F., the quantity of acid, curing time and temperature being varied according to the latex employed and the nature of the sponge desired.

TRADE OPPORTUNITIES FROM CONSULAR REPORTS.

A business man in the United States has been requested to supply names of American exporters of rubber, with a view of exporting to the Netherlands. Report No. 16,958.

A business man in Spain desires to secure the agency for that country for rubber tires and novelties. Report No. 17,023.

An exporters' association in the United States is in the market for 2,000 feet of garden hose with spiral tinned iron wire, as a sample, for a firm in Chile in the market for large quantities of hose. Report No. 17,051.

A taxicab company in Uruguay desires to represent American manufacturers of automobile tires. Report No. 17,079.

An opportunity is reported from Italy for the sale of rubber goods for surgical use—gloves, cushions, bags and tissues. Report No. 17,099.

The foreign office of a New York City firm desires to form commercial relations with manufacturers of rubber sponges and gloves. Report No. 17,137.

A Portuguese commission firm would represent American manufacturers and exporters of rubber tubing, syringes and other sanitary articles. Report No. 17,163.

A consular officer in one of the insular possessions where the duty on rubber shoes amounts to about 60 cents gold per pair, reports that a large department store in his district intending to install a rubber footwear department would like catalogs, prices and full information; also that there is a market in his district for rubber tire cement, on which the duty is 13 per cent. ad valorem. Report No. 17,186.

A wholesale and retail druggist is in the market for rubber goods. Report No. 17,228.

An opening is reported for cotton-lined rubber packing for packing boxes on ammonia compressors. Report No. 17,307.

The rubber reclaiming plant of the Bemis Rubber Co. has been closed down since March first. This is a well-equipped factory located at Watertown, Massachusetts, owned by Henderson & Korn, New York, who have withdrawn from the manufacture of reclaimed and are offering the plant at private sale.

RUBBER STATISTICS FOR THE UNITED STATES.

ARTICLES.	April, 1915.		Ten Months Ending April, 1915.	
	Quantity.	Value.	Quantity.	Value.
Imports of Rubber and Manufactures of:				
India rubber, etc., and substitutes for, and manufactures of:				
Unmanufactured—				
Balatapounds, free	101,232	\$39,056	2,199,316	\$860,589
Guayule gum	561,785	161,010	4,095,797	1,182,569
Gutta percha	2,515,151	142,938	12,964,184	637,428
Gutta	443,743	57,264	1,463,826	212,324
India rubber	20,425,334	10,284,000	136,932,185	65,084,558
India rubber scrap or refuse fit only for remanufacture	580,921	45,313	8,216,921	550,190
Total unmanufactured.		\$10,729,581		\$68,527,658
Manufactures of—				
Gutta perchadutyable		\$45		\$10,568
India rubber		39,862		700,244
Total manufactures of.		\$39,907		\$710,812
Substitutes, elasticon and similardutyable		\$2,963		\$27,738

IMPORTS OF CRUDE RUBBER BY COUNTRIES.

From:				
Belgiumpounds			1,902,370	\$950,872
France	44,800	\$13,772	661,408	272,900
Germany	6,987	843	739,105	358,931
Portugal	668,922	218,977	3,288,442	1,074,425
United Kingdom	10,204,246	5,430,215	57,581,380	29,776,980
Central American States and British Honduras	115,817	45,465	720,492	297,662
Mexico	59,293	34,116	1,411,959	546,446
Brazil	3,290,055	1,328,947	41,789,043	17,448,137
Other South America	169,996	65,931	3,951,302	1,700,923
East Indies	5,658,480	3,020,340	19,687,420	9,804,265
Other countries	206,738	125,394	5,199,264	2,853,017
Total	20,425,334	\$10,284,000	136,932,185	\$65,084,558

EXPORTS OF AMERICAN RUBBER GOODS

India rubber, manufactures of:				
Scrap and oldpounds	279,943	\$38,479	1,772,006	\$202,534
Reclaimed	581,598	83,458	4,992,649	696,339
Belting, hose and packing		149,648		1,490,964
Boots and shoes—				
Bootspairs	5,919	14,755	310,824	704,558
Shoes	109,471	53,925	2,013,377	1,955,486
Tires—				
For automobiles		655,043		3,552,651
All other		52,958		355,877
All other manufactures of		417,752		2,627,749
Total		\$1,476,018		\$11,586,158

EXPORTS OF AUTOMOBILE TIRES BY COUNTRIES.

Tires for automobiles—				
France				\$6,090
England		\$378,738		1,909,439
Canada		77,008		541,400
Cuba		21,023		138,853
Mexico		7,701		81,050
Australia		26,421		160,736
Philippine Islands		48,808		209,439
Other countries		105,344		505,644
Total		\$665,043		\$3,552,651

EXPORTS OF FOREIGN MERCHANDISE.

India rubber, etc., and substitutes for, and manufactures of:				
Unmanufactured—				
Balatapounds, free	57,636	\$19,931	906,706	\$348,371
Guayule gum	2,160	626	2,160	626
Gutta percha			3,460	1,488
India rubber	373,426	187,121	5,789,065	3,071,503
Total unmanufactured.		\$207,678		\$3,421,988
Manufactures of india rubberdutyable		\$20		\$5,478
Substitutes, elasticon and similardutyable				345

The automobile tire plant of the Continental Société Anonyme de Caoutchouc Manufacturé, at Clichy, near Paris, was destroyed by fire on May 16, the estimated loss amounting to \$250,000.

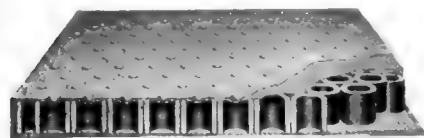
The Avon Sole Co., which manufactures the "Duflex" shredded leather and rubber sole, is building an addition to its plant at Avon, Massachusetts, work on which will be carried out with all possible haste. It is hoped by the company to have this addition ready for occupation by early Fall.

New Rubber Goods in the Market.

UTILIZING SCRAP HOSE IN A RUBBER MAT.

IN the construction of the rubber mat illustrated herewith—on which patent application has been made—the object has been attained of producing a mat suitable for many purposes at a considerable saving over the cost of the solid rubber or cloth inserted mat. The filler of this mat is made from scrap garden hose, the pieces being cemented together and

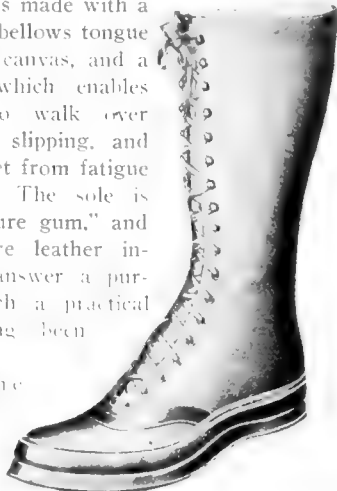
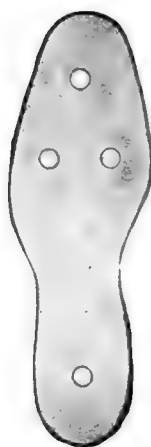
then wrapped with fabric and impregnated with rubber. Where protection against extra rough usage is required, an extra layer of fabric is placed on the upper surface, with a covering of rubber over it. All sections are then cured together, making a solid unit which gives equal distribution of strain. The surface pittings are caused by the fabric and rubber covering being forced into the ends of the hose sections, which helps to lock them securely together. This pitting can be eliminated if desired by the use of more stock. The mat as illustrated is adapted to use as a bowling alley pit mat, in dynamo pits, in power plants and anywhere where a mat is used to relieve the shock of heavy articles dropping on the floor. It will stand a greater amount of abuse than the ordinary rubber mat, and also will last longer, according to its designer. Other materials than scrap hose can, of course, be used as a filler, the degree of resiliency depending upon the kind of tubing employed. By the use of gum tubing an excellent gymnasium mat is produced. [Web. Brown, The Republic Rubber Co., Youngstown, Ohio.]



NEW RUBBER FOOTWEAR.

The wading shoe illustrated herewith is designed especially for general wading purposes, at the seashore, and for use of fishermen. It is made with a high top, with bellows tongue of waterproof canvas, and a suction sole which enables the wearer to walk over rocks without slipping, and protects the feet from fatigue and bruising. The sole is made from "pure gum," and the shoes have leather insoles. They answer a purpose for which a practical shoe has long been desired.

The same manufacturers have added a new pump to their already extensive line. This style is made in men's and women's. It has a fine black duck upper and white rubber sole and heel, also a white kid insole, which adds greatly to its appearance. [Apsley Rubber Co., Hudson, Massachusetts.]



SPORTSMAN'S WATERPROOF COAT AND LEGGINGS.

Among the new articles recently put upon the market and which are likely to meet with instant popularity among lovers of sports are the Hodgman Guaranteed Waterproof Sportsman's Coat and Leggings. These articles are suitable for golfing, fishing, hunting, motorcycling and various other similar uses. They are made of a light-weight but exceptionally strong olive



material, with a coating of fine rubber on the inside. The coat is cut full, with large arm holes, and is ventilated. There is one large inside pocket, tabs at wrist, and the collar buttons close. The leggings thoroughly protect the legs and knees and are made hip length. They are held in place by a loop at either side through which the belt or suspender passes. Owing to the light weight and pliability of the material, both articles may be rolled or folded into a very small bundle and conveniently carried. [Hodgman Rubber Co., New York.]

A NEW DIAMOND GOLF BALL.

The Diamond brand golf ball, which for so long has held a conspicuous place in public favor, is now being made with a white rubber enamel finish, by a process held to be exclusive, to keep the ball permanently white and free from tackiness and consequent inclination to pick up the dirt. In addition to the "Diamond Ace" and "Diamond Deuce," designed respectively for heavy and easy hitters and made in small sizes, in weights of 30 and 27½ pwt., a new ball, the "Diamond Trey," has been put on the market this season. This new ball, which is a full-size floater, is also made with the white rubber enamel finish, at the same price and with the same markings that distinguish the two smaller balls, which float. [The Worthington Ball Co., Elyria, Ohio.]

THE GRYPHON TIRE.

A new tire known as the "Gryphon," constructed of fabric treated by a special process by which the plies of fabric and rubber are made inseparable, is being manufactured by the Motor Tire Re-Construction Co., of 52 Vanderbilt avenue, New York.

RUBBER NOVELTIES FOR THE BATHING BEACH.

Illustrated several of the season's latest novelties in rubber goods. One of them so new that, although it has been widely applied for, the article has not yet come into any considerable quantity. This is the "Bathing Bag" shown in each of the illustrations, in the one closed as an attractive bathing cap, and in the other opened out to serve in the arm as a bag. This combination accessory is made of rubberized material in numerous color combinations. The manufacturer is turning out an extensive line of handkerchiefs, of which one in Quaker style is shown above. Another attractive novelty is the rubber stole or shawl, an improvement over the rubber cape of last season. This, like the



collar, is made in both plain colors and combinations, and has fringed ends. Still another is a rubber-covered rope, in colors to harmonize with the costume, which can be worn as a girdle when in the water, and used as a skipping rope on the beach. [The L. C. Studios, New York.]

One of the above illustrations shows a bandeau of rubber with rubber daisies in almost perfect imitation of the natural flower. Bands of numerous colors ornamented with these daisies are now ready for sale, their natural appearance and excellence of workmanship being quite in keeping with the standard of the line of rubber fruits and flowers produced by this manufacturer under the trade name Red-Berries. [Stem Specialty Co., New York.]

A RUBBER PROTECTED AUTOMOBILE WASHER

The automobile washer shown in the illustration is of the new type, being made of rubber, and is therefore supposed to have unusual lasting qualities. It can be attached to any ordinary hose, and besides the brush illustrated a sponge is supplied with each outfit. For these attachments an easily removable holder is held in place by a simple clamping device. A bracket is placed around the holder to protect the surface being washed from the sun. The handle accompanies the washer, being made of rubber, and is designed to handle the heaviest mud. [Tenneco Inc., Chicago.]

A BLACK TREAD NON-SKID MOTORCYCLE TIRE.

By the use of the motorcycle many persons are now able to take frequent brief trips into the country and to enjoy vacation tours of considerable length and interest through sections with which they would otherwise not be able to familiarize themselves. These extended country trips, over roads not always of the best, call for tires of extra strength—and to meet this demand there has just been placed on the market a new and distinctive type of tire. This is the Goodrich Safety Tread Motorcycle Tire. It is built of three plies of heavy automobile fabric and has a tread of jet black rubber, similar in design to the familiar safety bar tread of the Goodrich automobile tire. This new tire is most attractive in appearance and its maker claims for it greater strength and endurance, both because of the reinforced construction which is combined with a breaker strip and because of the high quality of rubber from which the tread is made. The tire is moderate in price, costing less than most of the non-skid motorcycle tires on the market. [The B. F. Goodrich Co., Akron, Ohio.]



A FOUNTAIN PEN IMPROVEMENT.

An important development in fountain pen construction is the introduction of a pen which possesses all the features of the regular type while at the same time having a pneumatic device for filling it direct from the ink supply. In the illus-

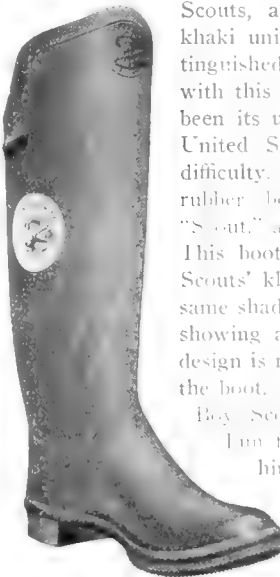


tration a small lever will be noted on the side of the pen. By simply raising and lowering this lever, with the point of the pen in the ink, the barrel is filled; then the lever is snapped down and tightly closes the ink tube. [L. E. Waterman Co., New York.]

THE BOY SCOUTS' OUTFIT NOW COMPLETE.

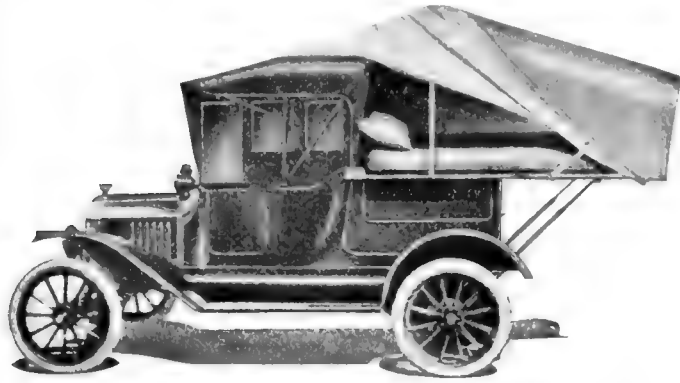
Every boy who is a real boy wants to belong to the Boy Scouts, and the next thing he wants is the khaki uniform that gives the Scouts their distinguished military bearing. But the trouble with this equipment up to the present time has been its unpreparedness for stormy days. The United States Rubber Co. has remedied this difficulty. It has just put on the market a new rubber boot, about knee length, called the "Scout," an illustration of which is here shown. This boot is made in tan color to match the Scouts' khaki suit and has a knit lining of the same shade. On the side there is a paper pasteur showing a Scout waving a flag, and the same design is reproduced in blue rubber at the top of the boot. It is a very attractive addition to the Boy Scout's uniform and thoroughly equips him for the arduous duties devolving upon him, regardless of weather.

Among the novelties in German toy manufacture is one which represents a French soldier being taken captive by a German, these figures being set in motion by a small rubber tube with ball attachment.



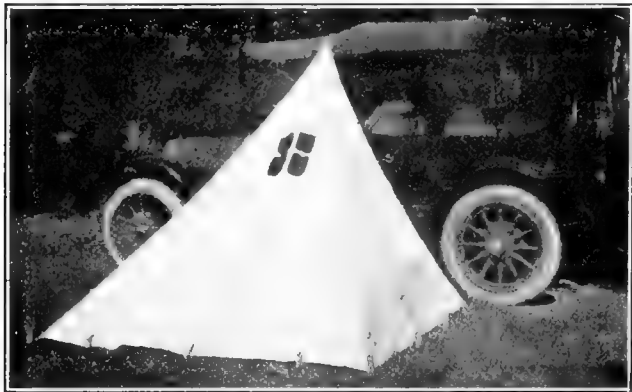
OUTING EQUIPMENT.

THE following illustrations show a variety of outing equipment new this season. Several of these improvements are intended for automobilists who prefer to spend their sleeping as well as their waking moments on the road, or close to it. The first illustration is of the "Auto Camp Bed," which rests on the rear of the automobile, and, having besides its water-



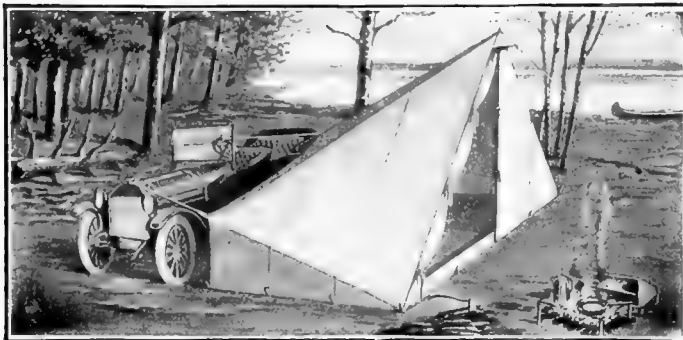
proof covering a pneumatic mattress 42x76 inches in size, provides sleeping quarters for two. This tent is designed for automobiles of the roadster type.

The peak tent is made, in its finest form, of balloon silk, rubberized, and is extremely light in weight, also capable of



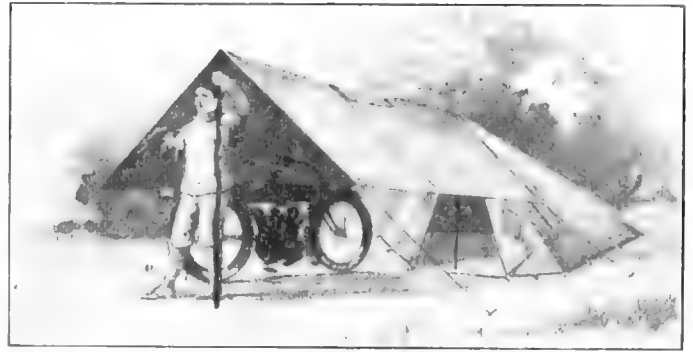
being rolled into very small space. To set it up requires only a few pegs and a rope, which is attached to the peak, thrown over the top of the machine and tied at the other side. A thick floor serves to protect against dampness and insects.

The third automobile tent is made of waterproof khaki and



other materials, and weighs, with waterproof ground cloth, three-jointed pole and carrying bag, from 20 to 28 pounds. It is large enough to hold three cots. (New York Sporting Goods Co., New York.)

A combination poncho and tent has been designed for the

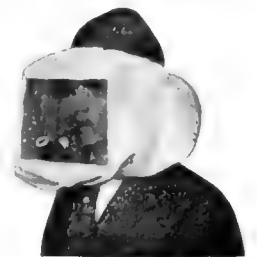


motorcyclist. The poncho is 68x94 inches in size, and weighs only 2 pounds. By a slight adjustment of tent pole and ropes the poncho can be converted into a tent extension to protect the motorcycle as well as the rider.

Should the camper be intermediate in his selection of a shelter, pitch his tent, and later find the place infested with mosquitoes, all he has to do is turn the smoker's head protector illustrated.



This is made of very fine gauze with a horse hair net in front in which is set a self-closing valve covered with slotted rubber. Through this valve he may insert his pipe



and smoke undisturbed by insect life. (Abercrombie & Fitch Co., New York.)

The pedestrian camper must carry his necessities on his back, and the aim to render this task as easy as possible has led to



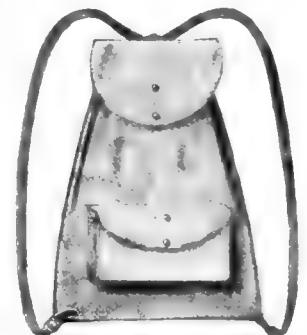
the introduction of several new waterproof ruck sacks. One of these has been especially designed for the Camp Fire Girls, and is called the "Squaw Bag." It is made of waterproof "Kiro" cloth, and will hold a load of 20 pounds. It weighs, alone, only 9 ounces. (New York Sporting Goods Co., New York.)

The designers of the smoker's protector make also the Alpine ruck sack, which

is illustrated, in use. This bag is made up of a number of gores, of waterproof khaki, weighing 2 3/4 pounds. It can be folded into very small space, or will open out to considerable size. It is said to be strong enough to carry a couple of rein-



deer, the strain being taken off the cloth and put on the leather straps. The last illustration shows another new ruck sack made of rain-tight government khaki

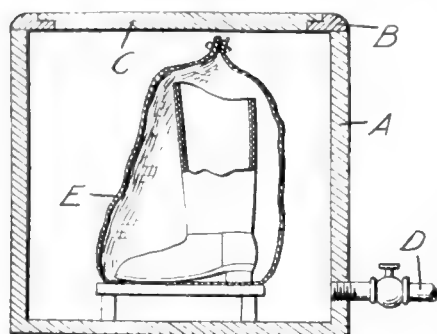


of strong texture to withstand all necessary strain.

New Machines and Appliances.

PRICE'S VACUUM VULCANIZERS.

IN the manufacture of tires, footwear, hose, and in fact practically all articles wherein rubber forms a component part, the elimination of air and moisture is very necessary to produce reliable goods. Price accomplishes this result by building

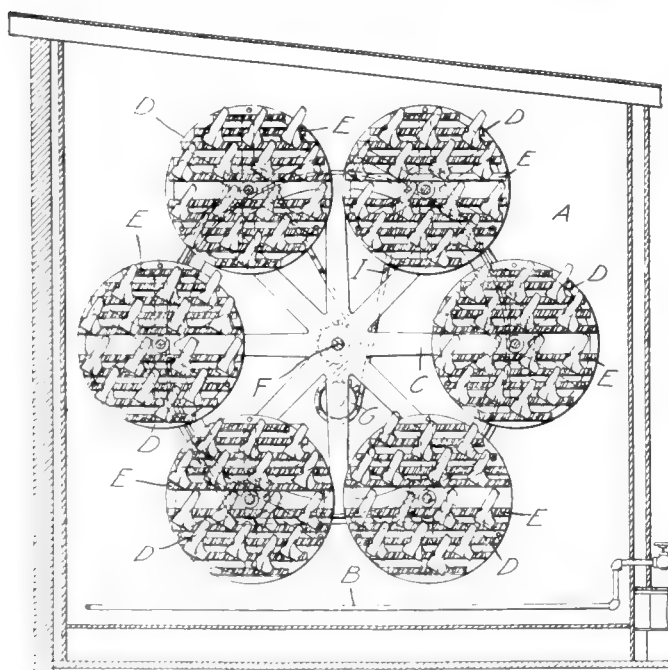


the cover with a removable plate of glass *C*, and *D* is the vacuum pipe. The air tight bag *E* is placed around the boot to prevent direct contact with the air. The bag is subsequently removed, and the boot subjected to the usual vulcanizing process. [Raymond B. Price, United States patent No. 1,132,971.]

RIEDER'S FOOTWEAR VULCANIZER.

This invention may be said briefly to consist of a drum that rotates within a closed vulcanizing chamber. The articles being vulcanized are revolved with the drum for the purpose of uniform vulcanization.

The oven or chamber *A* contains a heating coil *B* regulated by a valve. Within the oven a drum *C* is supported in bearings



and has mounted thereon a series of six stick carriers *D*. The adjacent sides of the carriers have a series of parallel angle iron racks *E*, which hold the sticks upon which the lasted rubber shoes are carried during vulcanization. These stick carriers are connected to shafts and revolve in bearings mounted upon the drum.

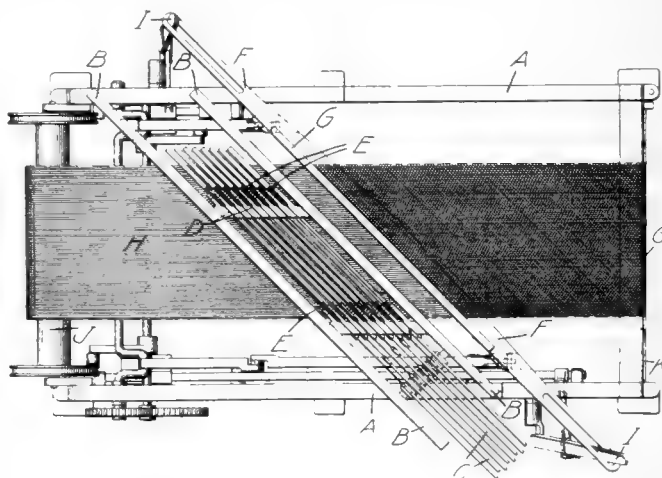
The drum is mounted upon and keyed to a shaft *F*, extending through and supported in bearings in the walls of the ovens and is driven by a reduction gear connected to the main driving shaft.

The stick-carriers while revolving with the drums are made to maintain the sticks and lasts constantly in a horizontal or level position, by sprocket wheels driven by sprocket wheel *G* and an endless chain *I*.

The sticks with the lasted rubber shoes are set in the notches of the different stick carriers, the drum being turned by hand to enable this to be done. When the carriers are fully charged the drum is revolved by power, steam is admitted to the coil, and the vulcanizing operation otherwise carried on in the usual way. Thus each article passes through the zones of the highest, medium, and lowest temperatures. [T. H. Rieder, United States patent No. 1,138,791.]

DIAGONAL WEFT LOOM.

This is a power loom for weaving fabrics in which the weft or filling is disposed at other than a right angle with respect to the warp threads, preferably at an angle of about forty-five degrees.



The lay and harness are arranged diagonally to the longitudinal axis of the loom and the warp threads, the latter passing, as is usual, from a beam, through the harness and through the reeds carried by the lay, which swings to and fro in the direction of the warp and diagonally to the length of the lay.

In the illustration, the side frames *A*, are connected together by cross beams, with arches *B*, extending between the frames at the top for supporting the harness frames. The arches *B* lie at an angle of about forty-five degrees and support the harness at the same angle.

The harness frames, any number of which may be used, are offset slightly so that their side edges will lie parallel to the warp. This is done to enable the warp to be moved vertically by the heddles of the harness when the latter is raised and lowered, without causing undue friction on the warp threads. The heddles are moved by a well known type of head motion and comprise a number of jacks *C*, in the form of elbow levers, from the upper end of each of which two straps *D*, extend, passing over rollers *I*, and down to the harness frame, there being two of said straps for each frame. On the opposite or horizontal ends of the jacks, other straps pass around pulleys at the bottom of the frame, thence toward the center of the frame and around pulleys, not shown, to the bottom of the harness frame. The jacks are operated by devices well understood and therefore not shown.

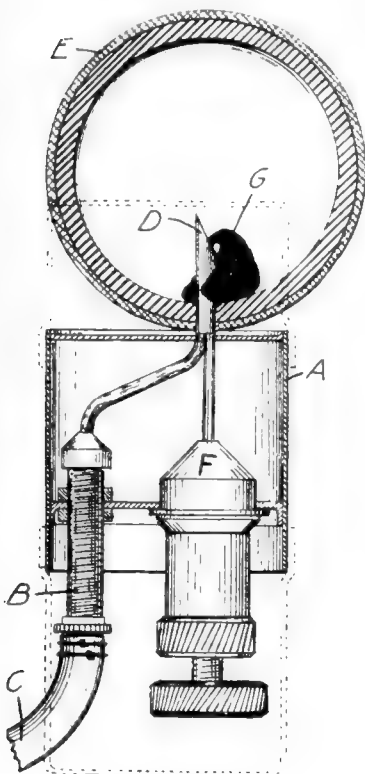
The lay *F* is similar to that commonly in use, and has the reed

G rising from the top through which the warp threads *H* pass. The lay extends across the frame in a diagonal direction parallel to said harness, the shuttle being thrown back and forth across the lay by the picker sticks *I*.

The warp threads *H* carried on the yarn beam *J* pass over a roller and thence through the heddles of the harness frames and the reed, the shuttle being driven back and forth on the forward side of the reed in order to weave the fabric which passes over a tension bar and is wound up on the cloth beam *K*. [A. H. Henderson and J. T. Mahon, assignors to the Henderson Rubber Co., United States patent No. 1,141,635.]

TENNIS BALL INFLATOR AND SEALER.

New tennis balls frequently lose their resiliency and become unsalable, while those used in play finally become soft and lacking in rebounding qualities. A device for inflating and restoring tennis balls, and one that can be easily carried about, is shown in the illustration.



A is the case that supports the air valve *B*, which is connected with an air pump (not shown) by a rubber tube *C*.

Assume the ball *E* to have lost its resiliency and to be "dead." The operator first punctures the ball with the needle *D*. He will then operate the pump, thereby inflating the ball, the operation being continued to whatever extent the operator deems best, and as determined by pressure of the fingers and thumb upon the ball. The pumping operation is then discontinued, whereupon the check-valve will automatically close and prevent the compressed air from escaping from the ball. The screw of the cement tube *F* is then operated, forcing the cement *G* into the ball, which the operator slowly rotates,

thereby equally distributing the cement about the puncture. The needle may then be withdrawn, and the cement will flow over and into the puncture, sealing it perfectly; for the rubber cement will adhere strongly to the inner structure of the ball. The dotted lines represent the caps or covers that are used when carrying the device about. [A. A. Green, United States patent No. 1,138,749.]

TIRE WRAPPING MACHINE.

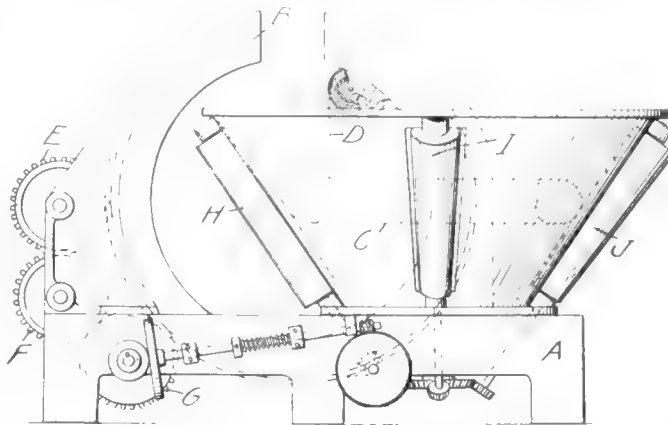
This invention of P. E. Welton is an improved machine adapted to wrap paper, tape or other fabric spirally around an annulus. It is designed to wrap strips of paper or cloth around pneumatic tires and tire casings, irrespective of their size.

Referring to the illustration, *A* is the base and *B* the annular shuttle whose function is to wind the strip *D* around the tire *C*. A portion of the shuttle is cut away, leaving an opening through which the tire is placed in the machine.

The removable flange of the shuttle *B* is formed with peripheral gear teeth. Two driving gears, *E* and *G*, mounted on the frame of the machine, engage with the shuttle gear, being placed apart so that when the cutaway part of the gear is adjacent to

one of the gears, the other driving gear will continue to turn the shuttle. An intermediate gear *F* transmits motion from the gear *E*, which is fixed to the driving shaft.

The tire while being wrapped is supported in a horizontal plane by five rollers *H*, *I*, *J*, and two others not shown. These rollers are inclined and revolve in bearings supported by upper



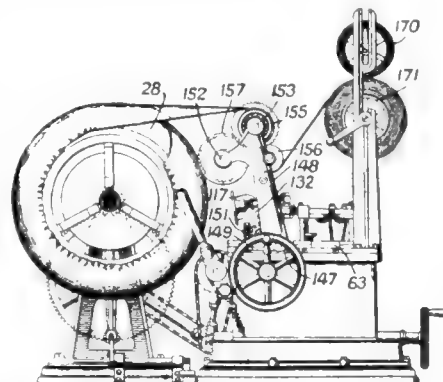
and lower annular frames. A portion of these frames is cut away, leaving a gap which is in the vertical plane in which the shuttle turns. Rollers *H*, and the one opposite (not shown) are the driving rollers, and they are preferably of cylindrical form.

In operating the machine, one side of the tire is passed through the opening in the shuttle and its supporting guide member. The tire will come to rest in a horizontal position in contact with the inclined rollers. When the tire is so placed, it will surround one side of the shuttle, and likewise one side of the tire will be surrounded by the shuttle. The end of the paper or fabric strip is then drawn from the roll and made fast to the tire and the machine set in operation. As the shuttle turns it winds the strip spirally upon the tire which is being slowly turned in a horizontal plane. [P. E. Welton, United States patent No. 1,140,729.]

A NEW TIRE CASING MACHINE.

W. C. Stevens has invented a machine for making fabric foundations for tire casings. Plies of frictioned fabric are wound under uniform tension on a rotating mandrel, means being provided for rolling down the sides of the shaped fabric layers without the formation of creases.

Referring to the drawing, the fabric is unwound from the drum 171, the liner being taken up on roller 170. The strip is then led under the guide-roller 156 and around the tension-roller 155 to the mandrel 28. This is rotated and drives the friction-roller 157 on the shaft 152 geared to the



shaft 153, carrying the roller 155 which is arranged to exert a dragging or tensioning action on the fabric. The frame 148, carrying the tensioning devices, rocks on a shaft 147, under the control of springs 151, bearing on horizontal arms 149 of the frame. After each layer is applied, the core is rotated at a greater speed and the devices for rolling down the sides of the fabric are advanced towards the core. The rolling discs 132, are advanced towards the core by the carriage 63, and are forced against the sides of the casing by a weight

suspended on a cable, the ends of which are attached to pivoted arms carrying the roller supports 117. The rollers act obliquely and their inclination is adjustable to facilitate working on the heads. A lever is provided for swinging the arms 117, clear of the core against the action of the weight, which lever may also be used to relieve or increase the pressure of the rolls on the core in trimming the edges of the finished foundation, a pair of cutters is fitted in adjustable holders on slides near the edges of the carriage 63. [W. C. Stevens, British patent No. 3585, 1914.]

OTHER DEVICES.

TIRE SHOE AND METHOD OF MAKING.—The frictioned fabric strip of loosely woven material is wound spirally around an annular form. The casing is then split around its inner periphery and the strips folded back, enclosing the bead wires and reinforcing the tread. [Charles T. Dickey, assignor to Voorhees Rubber Manufacturing Co.; United States patent No. 1,138,092.]

PROCESS OF MAKING INNER TUBES.—The stock is forced over a mandrel to which graphite has been applied. The tube is then vulcanized, and when reversed it presents a smooth, durable outer surface. [Arthur W. Savage; United States patent No. 1,138,250.]

MOLD FOR TIRE FILLERS.—This is for casting a resilient tire filler in the form of a ring having a continuous channel on its inner periphery. [H. J. Hardie; United States patent No. 1,139,276.]

MAKING COLLAPSIBLE CORES.—The separate segments are cast in dry sand molds and then assembled, producing a complete collapsible core; the customary way being to first make the core and then cut it into segments. [Peter Bacher; United States patent No. 1,139,325.]

COLLAPSIBLE CORE LOCKING DEVICE.—The locking ring is split and the ends are drawn together by the bolt-shaped locking device. This aligns the sections of the core and locks them in place. [Martin D. Kuhlke; United States patent No. 1,140,045.]

PNEUMATIC TIRE CORE.—This is a rubber core intended to be inserted in the inner tube or casing as a substitute for air. [Monsel Bracey; United States patent No. 1,140,242.]

SHEET METAL COLLAPSIBLE CORE.—The core sections are chambered for steam, and have relatively thin walls as compared with the heavy cast-iron sections of the ordinary core. [Joseph Chalfant and Harve G. Haun; United States patent No. 1,140,499.]

TIRE REPAIR AIR BAG.—This bag is designed to distend and support the walls of collapsible tubes during vulcanization in repairing automobile tires. [Peter Powell, assignor to Standard Tire & Rubber Co.; United States patent No. 1,140,527.]

CIRCULAR BRAIDER.—This machine makes tire casings in tubular form with closer mesh at one side than at the other, and is particularly adapted for spring wire braiding. [Adolph L. De Leeuw; United States patent No. 1,141,382.]

A NEW VULCANIZER TO BE CARRIED IN THE CAR.—The heat is applied and at the same time limited by improved devices. The clamping arms and screws are collapsible so that the vulcanizer occupies a small space. [James E. Bancroft; United States patent No. 1,141,519.]

TIRE REPAIR VULCANIZER.—This device can be used for bicycle as well as automobile tires. A variety of molds is not required as the sides of the vulcanizer are adjustable. [Charles E. Miller; United States patent No. 1,142,526.]

A RAMLESS PRESS VULCANIZER.—The usual hydraulic ram and cylinder are done away with in this new machine. The vulcanizer cylinder contains a piston, suitably packed and fitted, upon which the molds are placed, and the piston or ram is operated by hydraulic pressure. Thus the vulcanizer serves the

double purpose of a ram cylinder and a vulcanizing chamber. The head is raised and lowered by two small hydraulic rams fixed to the side of the vulcanizer. [J. H. Nuttall and David Bridge & Co., Limited, British patent No. 978, 1915.]

CEMENTING MACHINE. This invention applies cement or other coating materials to stock, and is particularly adapted for cementing leather shoe uppers. [Hiram Holden; United States patent No. 1,138,565.]

SOLE AND WELT CEMENTING MACHINE.—The novelty in this device consists in the regulation and control of the cement, and also in the means for cleaning the brush. [Charles P. Stanbon, assignor to United Shoe Machinery Co.; United States patent No. 1,138,903.]

DUPLEX CEMENT APPLYING MACHINE.—Where parts of leather footwear in duplicate, or rights and lefts placed face to face, are to be cemented, this machine applies the cement to both of the outside surfaces at the same time. [William F. Lautenschlager; United States patent No. 1,140,602.]

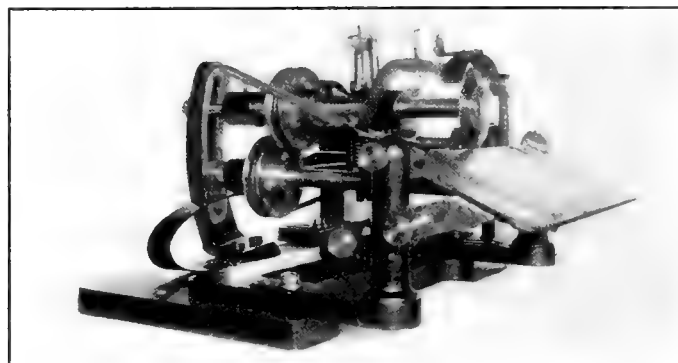
SOLE CEMENTING MACHINE.—This is used in the manufacture of leather footwear, where it is sometimes necessary to apply cement to one side only of a piece of stock and at other times to both sides. [Michael F. Brogan, assignor to United Shoe Machinery Co.; United States patent No. 1,141,311.]

A NEW MIXER ROLL.—The chambers between the outer shell and the hollow central shaft are supplied through the latter with heating or cooling fluid. [Miller & Co., and J. White; British patent No. 715, 1914.]

LATEX COAGULATING APPARATUS.—Shallow pans containing the latex are supported in tiers on frames within smoke chambers. The latex is coagulated by smoke produced in a wood combustion furnace. [F. Ripeau; British patent No. 2,281, 1914.]

THE WILLS OVERFLOW TRIMMING MACHINE.

This compact, light running machine is demonstrating its usefulness as an efficient labor-saving device in many leading American rubber factories, where it may be found singly or in groups—up to fourteen machines in number. A practiced operator with one of these trimmers can do perfect work, and in speed of output (2,500 pairs of heels per day) exceed that of the most expert hand-maker fully 200 per cent. Although designed primarily for heel trimming it can be made, by means of suitable attachments, to trim a variety of rubber work, such as soles, basin

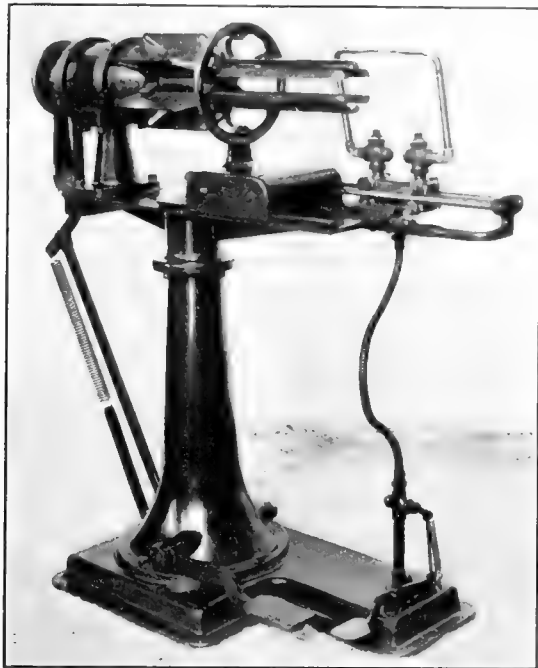


plugs, stoppers, valves, discs, diaphragms and numerous other small molded specialties. The machine consists of a pair of rotary shears, sensitively regulated by the operator with relation to the position of the overflow to be removed. The article is hand-guided or rotated past the cutting point as it rests on the adjustable work table.

The trimmer, in material, workmanship and design, embodies the best modern practice. It is a bench machine, requiring only one-eighth horse-power for its operation. [Arthur J. Wills, North Brookfield, Massachusetts.]

THE VAN NOTE INNER TUBE MACHINE.

A novel machine used in splicing inner tubes has recently been placed on the market by John E. Thropp's Sons Co. which is of interest to tire manufacturers and repair men. Referring to the illustration, it consists of a base and a pedestal that supports the expanding mandrel and the tube turning head. The mandrel is formed by six segments that are expanded and contracted by a

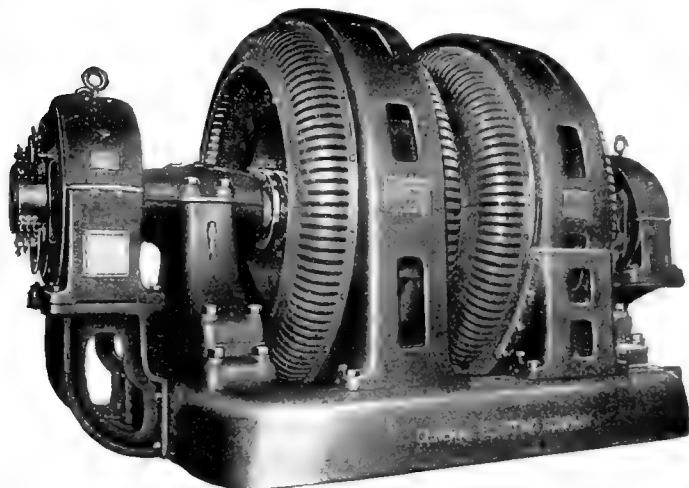


toggle joint operated by a foot treadle. Leather bands are fastened to the end of each segment and their opposite ends are attached to the drawing head wheel.

The skived tube is placed over the mandrel, which expands automatically, holding the tube firmly in place. The drawing head is pulled forward by the hand wheel and the bands turn the male end of the tube. The reverse turn is made by compressed air and a simple motion of the operator's fingers.

MOTOR-GENERATOR SETS.

Bulletin No. 42,552, entitled "Motor-Generator Sets," has just been issued by the General Electric Co. and is an attractive publication of 28 pages, containing numerous illustrations of



various types of motor-generator sets designed and manufactured by that company. They are divided into three general classes. First, direct current to direct current sets; second,

alternating current to direct current sets, or vice versa, varying in capacity from 0.2 kw. to 1,500 kw., and, third, alternating current to alternating current sets between two periodicities, commonly called "frequency changers." For this work machines are supplied which are pure motor generators; that is, all the power is converted into the mechanical form in the motor and reconverted into electrical power in the generator.

Frequency changers are necessary wherever power of a different frequency from that of the supply is desired. Sixty-cycle current has become practically standard in America for lighting purposes and also for a large number of power applications, since it permits the operation of incandescent lamps of all sizes and of multiple arc lamps, and it also gives a much larger number of speeds for induction motors. The most common use of frequency changers, therefore, is to furnish 60-cycle service from a 25-cycle hydro-electric transmission line or steam system. For instance, a large water power development brings cheap 25-cycle power over a long transmission line to a rubber mill having a 60-cycle system. The steam plant is shut down and power obtained from the hydro-electric system through frequency changers, the steam plant being maintained as a reserve in case of low water or transmission line trouble.

NEW TRADE PUBLICATIONS.

THE latest issue of "Foot-Prints," a periodical publication issued by the Canadian Consolidated Rubber Co., Limited, of Montreal, for distribution among the retail trade of the Canadian provinces, contains numerous suggestions for increasing sales not only of the many footwear styles being manufactured by the company, but also of its rubberized garments. This latest issue has 47 pages, illustrated with reproductions of photographs of company officials and with latest footwear and raincoat styles. The company maintains 28 service branches throughout the Dominion from which dealers may draw their stocks.

"South American Hand-Book" is the title of a 55-page paper-bound book recently published by the National Foreign Trade Council, 64 Stone street, New York, an organization composed of merchants, manufacturers, railroad and steamship men and bankers representing all sections of the United States, and interested in promoting foreign trade. The "South American Hand-Book" is a very complete compilation of information concerning the public indebtedness, foreign commerce and railway development of South American countries. It covers the whole South American field and is of special interest now when agitation is so strong in favor of foreign trade expansion.

A LOOSE LEAF SUGGESTION BINDER.

A novel form of publicity promotion and one likely to meet with more than usual appreciation by the dealer has been adopted by the Firestone Tire & Rubber Co., of Akron, Ohio, in the form of a window display suggestion binder which has been sent to Firestone pneumatic tire dealers throughout the country. As distributed, the binder contained two sheets showing two attractive window displays. At regular intervals throughout the year additional sheets containing other display ideas will be sent to these dealers, to be bound in their suggestion books; so that in time these will become volumes of valuable suggestions for sales promotion.

"WHITENEN" FOR GOLF BALLS

"Whitenen" is a new preparation for whitening golf balls and making them visible at almost any distance. It is put up in 25-cent cans supposed to contain enough material for 35 applications, and it can be applied, by the aid of a string and a pin, without ever soiling the hands. [Brauer Bros., St. Louis, Missouri.]

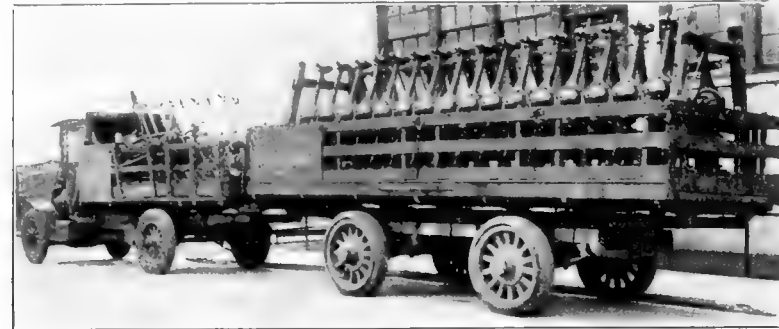
PUBLICATIONS OF THE SOCIETY OF AUTOMOBILE ENGINEERS.

The Society of Automobile Engineers, or the S. A. E., as it is generally called, publishes in pamphlet form the papers read, and the recommendations of its standards com-

mittees in the tire, and consequently the flattening of the tire on the ground varies with the load, except in so much as the element of air pressure intervenes to prevent this flattening. It is therefore possible to regulate the distortion or flattening of a tire by varying the air pressure and the load.



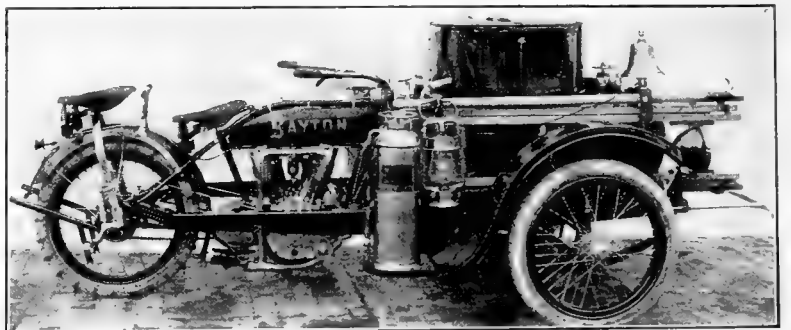
Regardless of the size of a tire, for a given weight pneumatic tires cover approximately the same surface of contact on the ground, but the smaller the tire the greater the distortion it must undergo to cover this given surface. A smaller tire will therefore have to distort itself more than a larger one in order to support a given weight. The greater the distortion the greater the wear on the tire. When the owner of a car finds that his tires are flattening too much, and therefore suffering extraordinary wear, he naturally will endeavor to prevent this by pumping more air into the tires to make them harder. This means a reduction of the resiliency of the tires, hard riding and the consequent undue wear of the machine and its mechanism. But tires must not be too big, for



mittees submitted at its semi-annual meetings. At the last meeting, held June 14-17, nearly a score of pamphlets were issued. They included printed reports of the various division standards committees on the following subjects: Iron and steel, springs, electric vehicles, electric equipment and carburetor fittings. The papers read at that time, and also published in pamphlet form, included "The Size and Inflation of Pneumatic Tires,"

by P. W. Litchfield, factory manager of the Goodyear Tire & Rubber Co., of Akron; "Pressed Steel Wheels for Pleasure Cars," by Orrel A. Parker; "Farm Tractors and Their Motors," by Philip S. Rose; "Automobile Clutches," by F. W. Herst; "Automobile Lubrication," by C. W. Stratford; "Spiral Type Bevel Gears for Automobile Drives," by A. L. Stewart; "Aeroplane Engines," by Neil Mac Coull, Jr.; "Aluminum Alloy Pistons," by Eugene Gruenewald; "Spring Design," by C. H. Gleason; "Road Tractors," by Frank H. Trego, and "Rational Method of Determining Mileage of Electric Vehicles," by T. H. Schoepf.

The paper by Mr. Litchfield on the "Size and Inflation of Pneumatic Tires" is of interest to tire manufacturers, as well as to automobile manufacturers and users of motor cars. Mr. Litchfield's theory is that a pneumatic tire is practically incapable of supporting compressive stress so that any



excessively large tires not only mean unnecessary cost, but further increase fuel consumption and wear and tear on the car.

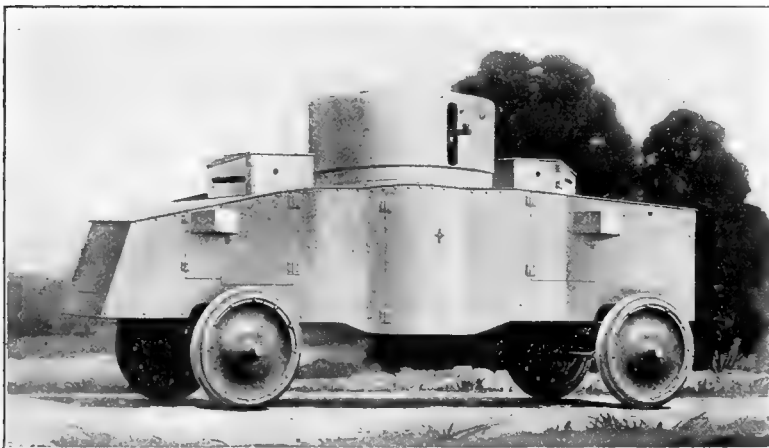
Mr. Litchfield treats at length the relation between tire wear and weight carried, tire dimensions and pressure of inflation.

He submits general approximate laws of tire wear and a logical schedule showing the proper relation between air pressure, tire size and weight carried.

Fully 33 per cent. of American cars are turned out by their manufacturers equipped with tires doomed to be overloaded. This is a mistake that costs car owners millions each year.

UNDERWRITERS' LABORATORIES 1915 BULLETIN.

The Underwriters' Laboratories, Inc., whose work in connection with the testing of materials and appliances used in the prevention of suppression of fires is well known to all manufacturers engaged in this line of production, has just issued its 1915 bulletin. The work of this organization is carried on under the general direction of the National Board of Fire Underwriters, its principal plant being located at Chicago, where it occupies a three-story and basement building containing about 45,000 sq. ft. of floor space, and valued, with equipment, at approximately \$200,000. It maintains a branch plant in New York City for the examination and testing of electrical devices, besides offices in the principal large cities of the United States, in Canada and in England. The pamphlet is illustrated throughout with reproductions of photographs of the Chicago plant and the equipment of its various departments.



load which is supported by the tire must be carried by a variation of the tension of the side walls of the pneumatic. The flattening of the tire on the ground relieves the tension on the walls of the flattened portion, but by increasing the air pressure in the other parts of the tire, this flattening increases the tension on the walls of the rest of the tire. The area of contact of a tire on the ground is not equal to the load multiplied by the air

The Editor's Book Table.

THE CEYLON HANDBOOK AND DIRECTORY AND COMPENDIUM of Useful Information for 1914-1915, with Statistical Summary for the Colony, and Planting Review. Compiled and edited by the staff of the "Ceylon Observer." Published by A. M. & J. Ferguson. [Octavo, 1,728 pages; cloth. Price, £1, 1s. MacLaren & Sons, Limited, London.]

IT is fifty-five years since the first Ceylon Handbook and Directory was issued. Each year this volume has increased in size, until the present volume, covering the year 1914-1915, has 1,728 pages, besides many additional pages devoted to indexes and other addenda, making a volume of over 1,800 pages. While this book covers everything of interest connected with Ceylon, it naturally devotes a great deal of space to rubber production, which in a few years has developed into such a great industry in that island. Perhaps the best way to show the rapidity of this increase is by giving the acreage planted in rubber, the bearing acreage and the exports. A table showing this information and covering the last ten years is given below:

ACREAGE AND EXPORTS OF CEYLON RUBBER PLANTATIONS.
Planted acres. Bearing acres. Exports. Tons.

1904.....	25,000	600	35
1905.....	40,000	1,000	75
1906.....	100,000	2,000	150
1907.....	150,000	2,500	250
1908.....	180,000	4,000	400
1909.....	184,000	5,500	681
1910.....	203,900	20,000	1,600
1911.....	215,000	35,000	3,194
1912.....	217,000	85,000	6,700
1913.....	220,000	150,000	12,515
1914.....	222,000	170,000	17,000
1915.....	224,000	186,000	20,000

While the present planted area in the above table is placed at 224,000 acres, the editors state elsewhere that the returns received in the latter part of 1914 indicate that there is at present a total rubber area of 240,500 acres.

The book is full of interesting tabulations, but there is space here to reproduce only one more. This table shows the yields of trees from four to ten years of age—as estimated by one of the local publications largely devoted to planting—in Ceylon and Malaya:

RUBBER YIELD OF TREES OF DIFFERENT AGES.

Age of trees. Years.	Yield, in pounds, per single tree.	Yield per acre, of 120 trees, in pounds.
4.....	1 1/4	90
5.....	1	120
6.....	1 1/2	240
7.....	3	360
8.....	4 1/2	460
9.....	6	720
10.....	7	840

It may be added that the editors intimate that this estimate of yields appears to them rather large—as it undoubtedly will to most people familiar with the subject.

The volume contains, of course, a list of all the rubber plantations in Ceylon, together with all the essential facts pertaining to them. It gives also the distribution of Ceylon rubber—how much goes to the various importing countries. In fact there is no sort of information relating to the Ceylon rubber industry that will not be found in this handbook.

SIXTY AMERICAN OPINIONS ON THE WAR. LONDON. T. FISHER Unwin, Limited, 1 Adelphi Terrace, W. C. [8vo. 166 pages.]

As the name implies, this volume contains extracts from speeches and writings of sixty prominent Americans on the European war. As it is published in London, the inference may safely be drawn that these opinions are uniformly favorable to the Allies. The particular reason for referring to the book in this publication lies in the fact that one of the longest extracts in the volume is taken from an article by a well-known rubber man, Adelbert Henry Alden, of Aldens' Successors, Limited, which was published in the "Westminster Gazette," London, on March 19 last. Mr. Alden is referred to by the

editor as "a direct descendant of John Alden, of the 'Mayflower.'"

Mr. Alden makes the statement that there are "no neutrals, individually, in America today. No one's feelings can be neutral; the government is—must be for the present—that is politics." He continues that the reason why a neutral condition of mind is impossible to Americans can be found in the prevailing feeling that this war is a contest between an armed empire with vast national ambitions on one side and democracy, seeking only to pursue peaceful avocations, on the other side. He makes a plea for preparedness, saying that while in the days of Washington his advice to keep free of European alliances was excellent, because it was possible, now it is no longer possible. He continues: "There were two worlds. America was living in one of them, far removed from the congested troubles of Europe which the inhabitants of America had escaped from. But times have changed. Science has changed the world into one world. What affects one country affects all countries; not next week, next month, next year, but within the hour. The American people have a subconsciousness of this, but they don't know it. They don't yet know they have more than sympathy for the Allies. They don't yet know that if the Allies lose, America's day of trial will come."

In his part authorship of this volume Mr. Alden appears in a representative group of America's most distinguished men. Among the other Americans, for instance, whose words are quoted, are Theodore Roosevelt, William H. Taft, Joseph H. Choate, Charles William Eliot, Robert Bacon, William Dean Howells, John G. Hibben and Albert Shaw.

PROCEEDINGS OF THE THIRD INTERNATIONAL CONGRESS OF Tropical Agriculture. Edited by T. A. Henry, T. L. McClintock Bumbury and Harold Brown, Honorary Secretaries of the Congress. [London: John Bale, Sons & Danielsson, Limited. Price, 10s. net.]

This volume contains abstracts of the 150 or more papers, from authorities in 50 different countries, read at the Third International Congress of Tropical Agriculture which, it will be remembered, was held in June, 1914, at the Imperial Institute, London, concurrently with the International Rubber and Allied Industries Exhibition; also reports of the discussions on many of the principal problems connected with tropical agriculture.

The subject of Technical Education received considerable attention at this congress, the claims of the West Indies as a competitor with Ceylon being ably urged by Professor Carmody, of the Trinidad Department of Agriculture, and by Harold Hamel Smith, editor of "Tropical Life"—the latter stating that if the United Kingdom means to enjoy that share of the ever-increasing commerce of Latin-America to which it is entitled, two colleges must be established, one in the East, say in Ceylon, and one in the West Indies, say in Trinidad. R. N. Lyne, director of the Department of Agriculture, Ceylon, outlined the educational methods adopted by that department, the subject of tropical agriculture being included in the public school curriculum.

The paper by W. A. Williams, of the North British Rubber Co., Limited, on "The Factors Which Determine Variation in Plantation Rubber, with Special Reference to Its Uses for Manufacturing Purposes," is given in full, being of interest alike to rubber producers and manufacturers.

Another paper on rubber, abstracted in this volume, is on "Increasing the Yield of *Funtumia* by the Sparano Tapping Method in the Belgian Congo," by M. Gisseleire, of the Colonial Office, Brussels. This new method is described as similar to the Christy method, but the full herring-bone is not made in one operation; the tapping is completed in 9 or 10 days, with a few new laterals traced each day. The yield produced by this method is said to be twice that collected by ordinary herring-bone tapping, and

machines that produced by the Schulze system of vertical incisions.

The "Proceedings" also includes a paper by Frank Shuman: "The Utilization of Sun Power for Irrigation and Other Purposes in Tropical Agriculture," in which he states that this power can be used for any purposes whatever. He estimates the cost of installation of such plants at about £31 per horsepower and claims that the cost of producing power by this means would be the same as if coal were less than 10s. per ton, whereas the price of coal in many parts of the tropics is quoted at £2. 10s.

Other subjects on which papers were read and on which discussions took place were: Organization of Agricultural Departments in Relation to Research; Agricultural Credit Banks and Co-operative Societies; Sanitation and Hygiene on Tropical Estates; Legislation Against Plant Diseases and Pests; Cotton and Cotton Cultivation, and Fertility of Soils in the Tropics. The fact that these papers were prepared and discussed by authorities on tropical agriculture from all over the world makes the book of value as a record of expert opinion on many of the tropical agricultural problems now of particular interest.

TABLES OF PROPERTIES OF OVER FIFTEEN HUNDRED COMMON Inorganic Substances. By Wilhelm Segerblom, A.B., Instructor in Chemistry at the Phillips Exeter Academy. 1909, Exeter, New Hampshire, Exeter Book Publishing Co. [Cloth, 8vo, 144 pp. Price \$3. postpaid.]

The author designed this work as an aid for students in analysis in corroborating their results. He groups the metals in six sections, according to Fresenius, and arranges the descriptive tables of properties on a very rational and convenient plan, facilitating reference. With the arrangement used it is possible not only to find all the salts of any one metal together, but also to compare any salt of the metal in question with the corresponding salt of each of the other members of the group to which the metal belongs. It is possible also to compare the salts of any group with the corresponding salts in the other five groups. The properties given include state, color, luster, crystalline form, deliquescence, efflorescence, stability in air, action on test paper, melting point, behavior when heated, solubility in water, alcohol and acids, and any other properties characteristic of the substance in hand. For convenience the formulae, chemical names and the common names are all given. The index is designed to locate a salt when only the common name is known.

The work is a valuable addition to the analyst's library.

RUBBER IMPORT AND EXPORT REGULATIONS.

A NUMBER of developments occurred during the month of June, relating to the imports of crude rubber from the East and to the export of rubber manufactured goods. In some respects the regulations have been slightly relaxed, and in other respects they have been somewhat increased.

RUBBER GOODS MAY NOW BE SHIPPED TO ITALY.

The British Consul General at New York gave notice on May 28 that the British Foreign Office, in view of the fact that Italy had joined the Allies, had consented to lift the embargo on rubber shipments to Italy. He authorized the altering of the guarantees given the British government by the insertion of the words "or Italy" after the word "Russia" in the sixth paragraph of the guarantees which were agreed upon last January between the British government and the representatives of the Rubber Club. When this change is made the paragraph will read:

"We will not sell any manufactured or partly manufactured rubber goods to any person in the United States without satisfying ourselves that there is no intention on his part to export, or resell the same for exportation, to any countries in Europe other than Great Britain, France, Russia or Italy, otherwise than

by shipping to the United Kingdom and reshipping from there, under license to be obtained for export therefrom."

PROCEDURE IN CASE RUBBER IS REJECTED

On the third of June, Secretary Vorhis, of the Rubber Club, sent a circular addressed to all the members of the rubber trade regarding the method of procedure in case for any reason rubber which had been released for their account was rejected. The following paragraphs give the essential matter of the circular: "The attention of manufacturers is called to the fact that they are accountable for rubber released for their account, and that in case of rejection of rubber, in whole or in part, the manufacturers must immediately notify the secretary of The Rubber Club of America, Inc. In such cases, the secretary must promptly receive from the seller of the rubber either a new guarantee from a new customer for the delivery of the rejected rubber to them, or the seller must put the parcel in trust (pending the resale of same) with The Rubber Club of America, Inc."

EXPORTING GOODS CONTAINING ONLY A SMALL QUANTITY OF RUBBER.

The British government has announced that the rubber guarantee signed by rubber manufacturers, stipulating that shipments of rubber manufactured goods to neutral European countries should be made via England, is not intended to apply to articles of personal or household use containing only a small quantity of rubber, such, for instance, as suspenders, garters and typewriters.

The Control Committee of The Rubber Club, however, suggests that even in such cases, manufacturers notify the British Consul General at New York of all such shipments which they intend to make direct to neutral European countries.

CLEARING PLANTATION RUBBER FROM THE DUTCH EAST INDIES.

On June 24, the secretary of the Rubber Club sent a circular to crude rubber importers, brokers and dealers, referring to the import of rubber from the Dutch East India plantations, in which the following paragraph appears: "Realizing that the British government wishes the most accurate record possible kept of plantation rubber arriving in this country from the Dutch East Indies, the Rubber Control Committee has unanimously passed a resolution recommending that all crude rubber importers, brokers and dealers in this market file the British rubber guarantees for all such rubber with The Rubber Club of America, Inc., and have its disposition recorded in exactly the same manner as though the rubber had been consigned to H. B. M., Consul General at New York."

THE EMBARGO FUND PAYS A DIVIDEND.

It will be recalled that when the work of removing the embargo on plantation rubber was first undertaken by the Rubber Club last January, it asked for voluntary contributions from members of the club to defray the necessary expenses of the Embargo Committee in conducting its negotiations with the State Department and the British government. As the fees received in connection with the work of the committee have for some time fully covered the expenses involved, the Executive Committee voted at its meeting June 11, 1915, to refund *pro rata* to the contributors the unexpended balance now remaining of that fund.

The total amount subscribed was \$3,118.96. The expenses of the committee amounted to \$1,745.32, leaving a balance of \$1,373.64. This was returned to the original contributors by the treasurer of the club on June 24 and amounted to a refund of practically 44 per cent.—quite a handsome dividend.

The India Rubber, Gutta Percha & Telegraph Works Co., Limited, of Silvertown, England, has announced that owing to the increased cost of production because of the higher prices of materials and labor consequent upon the war, it has been found necessary to make a 10 per cent. advance in the price of its gutta percha, india rubber, silk and cotton covered wires.

THE SIXTEENTH ANNUAL RUBBER CLUB OUTING.

FOR several years the Rubber Club has been looking toward the Vesper Club as an ideal place to hold its summer outing. It is, in the first place, practically as accessible as the Country Club at Brookline, for example. It is delightfully situated on the banks of the Merrimac River, and has golf links that are noted throughout New England. There are tennis, squash and racquet courts, indeed facilities for all out-of-door sports. The



CLUB HOUSE — THE VESPER CLUB, WITH TENNIS COURTS IN FOREGROUND.

club house is commodious and elegant. It is really quite an honor for the members of the Vesper Club to give up their home and grounds for a whole day to an outside organization, and is something that they rarely do.

With frequent train service from Boston to the club grounds and specials for the club members; with active, capable men at the head of the Sports, Entertainment and Dinner Committees, the outing, to be held July 14, promises to be the best yet. And if the responses that are rapidly coming in are a criterion it will be the biggest yet.

A special train will leave North Station, Boston, at 1 p. m. sharp on the 14th, and will arrive at the grounds in less than an hour. A buffet lunch will be served en route. An excellent program has been arranged by the Outing Committee. There



A CORNER OF THE VESPER CLUB GROUNDS

will be a tennis tournament, consisting of inter-firm doubles and singles, with an entrance fee of fifty cents. Clarence H. Low will be in charge. The golf tournament will consist of a driving contest and caddy golf—entrance fee one dollar, M. G. Hopkins in charge. Golf cards must be in by 2 p. m. There will also be quoits, races and water sports, bathing suits being furnished. The Lynn Cadet band will supply the music. The train will return to Boston at 9 p. m. Tickets, which are \$5, include everything excepting tournament entrance fees.

MEETING OF THE EXECUTIVE COMMITTEE OF THE RUBBER CLUB.

A MEETING of the Executive Committee of The Rubber Club of America, Inc., was held at the Union League Club, New York, June 11. There were present George B. Hodgman (chairman), Frederic C. Hood, Henry C. Pearson, Van H. Cartmell, Harvey C. Firestone, William E. Bruyn, Sidney S. Meyers and H. S. Vorhis (secretary). Mr. Meyers was appointed general counsel for the club. Harry T. Dunn, who was elected director at the annual meeting, being unable to serve, Harry G. Fisk was elected in his place. The Embargo Committee presented a financial report through its treasurer. This committee in the early days of the embargo collected funds by subscription from the firm members for defraying current expenses. The members of the committee were compelled to make many trips to Washington, and Mr. Work was sent to Europe in the interest of the rubber trade. The amount of money collected was \$3,318.96. It was later decided to return the money collected from the rubber reclaimers, and this amount, \$200, was deducted, leaving \$3,118.96 available for disbursement. The total expense as audited by the committee was \$1,745.32, leaving a balance of \$1,373.64, which is to be refunded *pro rata* to the original subscribers.

FIRM MEMBERS

R. J. Caldwell Co., Inc., New York.
Frederick H. Cone, New York.
Continental Rubber Co. of New York, New York.
J. P. Devine & Co., Buffalo, New York.
J. Frank Dunbar, Boston.
Frazar & Co., New York.
Gibney Tire & Rubber Co., Conshohocken, Pennsylvania.
Gove & French, Inc., New York.
Greensburg Tire & Rubber Co., Greensburg, Pennsylvania.
E. D. Hewins, Inc., Boston.
Gustave Kush, New York.
J. H. Lane & Co., New York.
Michelin Tire Co., Milltown, New Jersey.
L. J. Muttly Co., Boston.
The Savage Tire Co., San Diego, California.
Simplex Wire & Cable Co., Boston.
A. Schrader's Son, Inc., Brooklyn, New York.

ASSOCIATE MEMBER.

Harry M. Hope, Boston.

THE RUBBER CLUB MOVES INTO LARGER QUARTERS.

As may well be imagined, the work of the Rubber Club of America, Inc., since it undertook the straightening out of the embargo difficulty with England and kindred matters of interest to the club members, has greatly increased, necessitating a clerical force of considerable size. The offices recently taken in the Whitehall building, 17 Battery Place, New York, have already been outgrown, and about the middle of June the club moved into more commodious quarters in the same building. The new offices are on the fourth floor, and consist of private offices for the secretary and the chief accountant, a room of suitable dimensions for committee meetings, and a large room adequate for the use of the clerical force.

The Rubber Goods Manufacturers' division and the Rubber Sundries Manufacturers' division of the club are now engaged in carrying out some important work for their particular branches of the trade. The government of Canada has recently decided to allow scrap rubber to be exported to the States, and all these increased activities have compelled the club to move into these more adequate quarters.

Speaking of the import of Canadian scrap, this rubber, in car-load lots, is to be consigned to the New York British consul, and cleared after the usual guarantees made by the importer have been approved by the club. A charge of 50 cents a ton is made for this service.

News of the American Rubber Trade.

THE BOSTON BELTING CO. EQUIPS A LABORATORY.

THE Boston Belting Co. is about to equip a laboratory and testing department at its works. Mr. George Ellinwood, an experienced rubber chemist, will be in charge. Although this is a new addition to the resources of the company, it is worthy of note that their experimental and development work antedates that of practically every other American rubber company. It is an interesting and authentic fact that Charles Goodyear conducted much of his experimental work in compounding and vulcanizing in the original rubber factory in Roxbury which in later years developed into the Boston Belting Co.'s plant located on the same site. In this connection it is stated that the equipment of the new laboratory will include the original table used by Goodyear in his studies and experiments, and that the relic is still in usable condition.

ATLANTIC RUBBER COMPANY MOVES INTO NEW QUARTERS.

The Atlantic Rubber Co. has just moved from its former location at Hyde Park and established itself in more commodious quarters at Atlantic, Massachusetts. The new plant, which covers a large part of two acres of land, located near the railroad, with spur-track facilities, is thoroughly modern in construction and equipment and will, the company believes, provide for expansion for some time to come. This company manufactures various patented and trade-mark products, druggists' sundries, hospital sheetings and rubberized fabrics of all kinds, specializing in rubber soles and heels and molded goods.

A CHEMICAL INDUSTRIES EXPOSITION.

During the week commencing September 20 there will be held at New York, in the Grand Central Palace, a National Exposition of Chemical Industries. This exposition, in which the rubber trade is to be represented, has been organized to demonstrate the extent and importance of the chemical industries in America and to show to American enterprise both the developments that have taken place and the importance of further activities in this direction. An exhibition of the products, processes and apparatus manufactured and in use by American firms is expected to awaken an interest in and appreciation of the possibilities in the chemical industry and to contribute to an exchange of ideas between the pure and applied technologists.

Among the prominent chemists who compose the advisory committee are R. P. Perry, of the Barrett Manufacturing Co., and T. B. Wagner, of the Corn Products Refining Co., both of 17 Battery Place, New York.

THE PENNSYLVANIA COMPANY EXTENDS ITS TIRE GUARANTEE.

Following the recent official tests of Vacuum Cup tires, made by the Automobile Club of America, in which an average service of 6,760 miles was given by 9 tires in use on heavy vehicles, with three tires exceeding 8,900 miles' service each, the Pennsylvania Rubber Co., of Jeannette, Pennsylvania, which makes this tire, has extended its guaranteed mileage from 4,500 to 6,000 miles. This guarantee will apply also to all Vacuum Cup tires at present in service.

The eleventh annual picnic of the Athletic Association of this company was held on June 5 at a near-by resort, being attended by a large number of employees, with their families and friends. The program included various sports and dancing.

RUBBER COMPANIES ENCOURAGE ENLISTMENT.

At a meeting of the Executive Committee of the United States Rubber Co., held June 17, it was voted to approve of all employees of the United States Rubber System joining local militia and naval reserve companies.

It was also voted that the pay of such employees should be continued while engaged in militia duties, and that the annual tour of duty would not interfere with their regular vacations.

The Hodgman Rubber Co took similar action some weeks ago, when the board of directors passed a resolution that all those in the company's employ who enlisted in the militia should be granted time for ordinary military service with full pay and without deducting the time occupied in this service from the regular vacation period.

RUBBER COMPANY DIVIDENDS.

The American Chicle Co., of New York, has declared a quarterly dividend of $1\frac{1}{2}$ per cent. on its preferred stock, payable July 1 to stockholders of record on June 25.

The Boston Woven Hose & Rubber Co., of Cambridge, Massachusetts, paid on June 15 semi-annual dividends of 3 per cent. on its common and preferred stocks.

The Goodyear Tire & Rubber Co., of Akron, Ohio, has declared a quarterly dividend of $1\frac{3}{4}$ per cent. on its preferred stock, payable July 1 to stockholders of record on June 20.

The Kelly-Springfield Tire Co., of New York, has declared a quarterly dividend of $1\frac{1}{2}$ per cent. on its 6 per cent. preferred stock and a quarterly dividend of $1\frac{3}{4}$ per cent. on its 7 per cent. preferred stock—both payable July 1 to stockholders of record on June 15.

The Rubber Goods Manufacturing Co., of New York, paid on June 15 a quarterly dividend of $1\frac{3}{4}$ per cent. on its preferred stock and a quarterly dividend of 1 per cent. on its common stock.

The Boston Belting Co., of Boston, has declared a quarterly dividend of \$2 per share, payable July 1 to stockholders of record on June 15.

The McGraw Tire & Rubber Co., of East Palestine, Ohio, paid on June 1, a semi-annual dividend of 5 per cent. on its common stock.

The Washburn Wire Co., of Providence, Rhode Island, has declared a quarterly dividend of $1\frac{3}{4}$ per cent. on its preferred stock, also a quarterly dividend of 2 per cent. on its common stock—payable July 1 to stockholders of record on June 18.

RUBBER COMPANY SHARE QUOTATIONS.

The following market quotations of the shares of rubber manufacturing companies on June 25 last are furnished by John Burnham & Co., 31 Nassau street, New York, and 41 South La Salle street, Chicago:

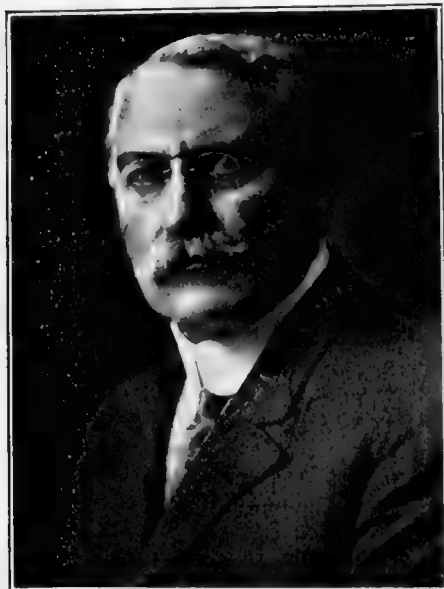
	Asked.
Ajax-Grieb Rubber Co., common.....	86 1/2
Ajax-Grieb Rubber Co., preferred.....	107 1/2
Firestone Tire & Rubber Co., common.....	80 3/4
Firestone Tire & Rubber Co., preferred.....	111
The B. F. Goodrich Co., common.....	51
The B. F. Goodrich Co., preferred.....	102
Goodyear Tire & Rubber Co., common.....	73 1/2
Goodyear Tire & Rubber Co., preferred.....	106 1/4
Kelly-Springfield Tire Co., common.....	159
Kelly-Springfield Tire Co., first preferred.....	86
Kelly-Springfield Tire Co., second preferred.....	160
Miller Rubber Co., common.....	185
Miller Rubber Co., preferred.....	104
Portage Rubber Co., common.....	39
Portage Rubber Co., preferred.....	93
Swinehart Tire & Rubber Co., common.....	79
United States Rubber Co., common.....	53 1/2
United States Rubber Co., first preferred.....	107 1/2

VICE-PRESIDENT VAN H. CARTMELL OF THE RUBBER CLUB.

AT the last annual election of officers of the Rubber Club of America, Inc., which took place on April 21, Mr. Van H. Cartmell, president of the Kelly-Springfield Tire Co., was elected one of the vice-presidents. This is a compliment that any man in the trade might be pleased to receive, and, conversely, the

choice of Mr. Cartmell for this position shows that the Rubber Club is still most discriminating in the matter of official selection.

Mr. Cartmell comes logically by the presidency of his company, as he originated, some fifty years ago or so, in the distinctively presidential state of Ohio. He started his commercial career while a young boy as a clerk in a store at Springfield, his native place. The proprietor valued his services at \$5 a week. But the



VAN H. CARTMELL.

young clerk thought perhaps there was more money to be made outside, so he soon connected himself with a manufacturing house, and in a few years' time was its manager.

Following the precedent set by many distinguished westerners, when he reached years of sound discretion he came East, and in 1894 he became attached to the Consolidated Rubber Tire Co., now the Kelly-Springfield Tire Co., as manager of its Boston office. Two years later he was put in charge of the larger office in New York, and in 1903 he was made president of the company, a position which he still holds.

That the company has been successful under President Cartmell's administration is obvious from its present position in the trade. And the reasons of its success under his management are not far to seek. Integrity, honesty and sanity—by which is meant that sound judgment that keeps in the profitable path and avoids all uncertain ventures—have marked Mr. Cartmell's administration. Incidentally, he has that fine gift of urbanity which not only leads to prosperity in business, but especially means social success, and is a most valuable asset for an officer of an organization like the Rubber Club.

While Mr. Cartmell has devoted himself assiduously to tire manufacture for the last quarter century, and is an expert in this art, he does occasionally relax sufficiently to take in a ball game—an honest American taste which his residence in New York City permits him from time to time to cultivate.

RUBBER SHIPMENTS TO ATLANTIC AND PACIFIC PORTS.

The Rubber and Tin Exports Committee, which is a division of the War Trade Department of Great Britain, recently issued a statement through Lord Balfour, chairman of the committee, to the effect that arrangements have now been made so that plantation rubber can be shipped to any Atlantic and Pacific ports of the United States. The rubber must be consigned in the former instance to the British Consul at New York and subject to the customary rules. When shipped to Pacific ports the rubber is cleared through the British Consul at San Francisco.

PERSONAL MENTION.

Frederick H. Jones, treasurer of the Tyer Rubber Co., of Andover, Massachusetts, expects to start within a few days for the San Francisco fair. He will visit San Diego and other places in California, returning East about the first of September.

Henry C. Herring, sales manager of the New York Rubber Co., who has been ill for the last three months, is improving in health and hopes to return to his official duties within a short time.

Frederic H. Sanford, who was formerly connected with A. H. Alden & Co., Limited, Manaus, and who has been passing the winter in Cuba, has recently returned to the United States and is now at his home in West New Brighton, New York.

John F. Lanier, who formerly handled Diamond tires for The B. F. Goodrich Co. in the southwest, with headquarters at St. Louis, has become associated in a similar capacity in another section with the Norwalk Tire & Rubber Co. of Norwalk, Connecticut.

Nicholas F. Brady, prominent in the directorate of the United States Rubber Co., is president of the newly organized Broadway Subway & Home Boroughs Car Advertising Co. The offices of this company are at 31 Nassau street, New York, and its object is to handle the advertising and news stands on the system operated by the Brooklyn Rapid Transit Co., in which Mr. Brady is also interested.

Dr. Eugenio Dahne, who is at the head of the Brazilian section of the Panama-California Exposition at San Diego, California, has just returned from Brazil with a large exhibit of the products of the states of Sao Paulo, Rio Grande do Sul, and Rio de Janeiro. This exhibit will consist in part of 52 cases of fine Pará rubber that figured in the rubber exposition at Rio de Janeiro two years ago, and was to go to the London exhibition last year. For some reason it did not get to London and will now go to San Diego and be sold when the exposition closes.

W. E. Adams, for some time past connected with the sales department of the Ford Motor Co., has joined the staff of the Lee Tire & Rubber Co. of New York, which is the eastern sales branch of the Lee Tire & Rubber Co., of Conshohocken, Pennsylvania. The president of the New York company, W. B. Fewell, is also a former automobile man, having served for some time as New York manager for the Oakland Motor Co.

Col. Samuel P. Colt, president of the United States Rubber Co., expects soon to take a trip across the continent to the Panama-Pacific Exposition at San Francisco.

Samuel Norris, secretary of the United States Rubber Co., expects to pass the summer with his family in one of the cottages of the Adirondack League Club.

Waldemar Scholz, one of the prominent rubber exporters of Brazil, with headquarters at Manaus, is spending a couple of months at Petropolis, a beautiful summer resort near Rio de Janeiro.

William Johnstone, brother of J. T. Johnstone, the rubber importer of 22 William street, New York, has just been commissioned a lieutenant in the famous Black Watch (42nd Royal Highlanders). Miss Johnstone, a sister, who has been in the Red Cross service in England, has just left for foreign service.

At the semi-annual meeting of the Society of Automobile Engineers held in June, P. W. Litchfield, factory manager of the Goodyear Tire & Rubber Co., Akron, presented a valuable paper on the subject of "Size and Inflation of Pneumatic Tires." The paper is a careful study of theoretical considerations and practical conditions affecting the durability of tires. Tire wear, overloading and proper inflation are scientifically discussed, and a basis presented for a logical schedule of tire inflation and loading.

THE SILVERTOWN CORD TIRE WINS ENCOMIUMS OF RACING DRIVERS.

The Silvertown cable cord tire, made by The B. F. Goodrich Co. of Akron, Ohio, figured conspicuously in the Speedway Race of 500 miles at Indianapolis, Indiana, May 31, not only the winning cars but every car that finished in the contest being equipped with these tires. DePalma, the winner in the event, is quoted as stating that "There is nothing like them."

NEW INCORPORATIONS

Ashley Rim Co., Inc., May 22, 1915; under the laws of New York; authorized capital, \$10,000. Incorporators: Robert W. Ashley, Ernest G. and Russel H. Kittel—all of 505 Fifth avenue, New York City. To manufacture auto supplies and appliances, etc.

Bonnite Insulator Co., Inc., May 25, 1915; under the laws of New York; authorized capital, \$4,000. Incorporators: George H. Clark, 386 South Belmont avenue, Newark, New Jersey; Albert H. and Paul Bergman, 62 West One Hundred and Twenty-fourth street, New York City. To manufacture automobile ignition insulating cable, etc.

Burford & Co., Limited, May 25, 1915; under the laws of New York; authorized capital, \$2,000. Incorporators: Henry C. Burford and Francis C. Lord, 8 Bridge street, and Thomas H. Wight, 30 Church street—both in New York City. Automobiles, rubber goods, etc.

Cortland Tire & Rubber Co., May 25, 1915; under the laws of New Jersey; authorized capital, \$100,000. Incorporators: Herbert V. Hardman and George C. Sleeth, Belleville, and Walter B. Hopping, Montclair—both in New Jersey. To manufacture, buy, sell and deal in rubber tires, tubes, rubber and rubber goods of every kind, etc.

Crawfordsville Rubber Co., May 6, 1915; under the laws of Indiana; authorized capital, \$5,000. Incorporators: Charles A. Westfall and William M. White, Crawfordsville, and Henry B. Coats, Veedersburg—both in Indiana. To manufacture rubber goods generally, including auto. tires and accessories.

Falls Tire Co., Inc., June 14, 1915; under the laws of New York; authorized capital, \$15,000. Incorporators: Henry Weiss, 600 West One Hundred and Sixty-ninth street, Agnes G. Sanger, 1947 Seventh avenue, New York City, and Marcella Sanger, 93 Remington avenue, Jamaica, New York. To manufacture tires and rubber goods.

Fay Motor Fabric Supply Co., Inc., May 8, 1915; under the laws of New York; authorized capital, \$20,000. Incorporators: Elmer M. Kimbark, Grey M. Hessler and Anna D. Moritz—all of 27 William street, New York. To manufacture fabrics used in the automobile trade, etc.

Kansas City Tire & Rubber Corporation, May 28, 1915; under the laws of New York; authorized capital, \$335,000. Incorporators: Leopold M. Lehr, Ralph Atkins and Joseph A. Arnold—all of 22 William street, New York City. General tire and rubber manufacturing business.

Plainfield Auto Tire Co., May 29, 1915; under the laws of New Jersey; authorized capital, \$50,000. Incorporators: Edward J. and Margaret Way, 514 Arlington avenue, Plainfield, and Irving R. Stebbins, 64 Grandview avenue, North Plainfield—both in New Jersey. To manufacture, buy, sell and deal in automobiles, tools and supplies of all kinds used in connection with automobiles, etc.

Price Rubber Co., H. A., May 13, 1915; under the laws of Ohio; authorized capital, \$15,000. Incorporators: H. A. and Mary V. Price, E. E. and Margaret McGalliard, and John Rowley. To buy and sell automobile, motorcycle and bicycle tires, rims and tubes.

Punctureless Auto Tire Co., The, May 14, 1915; under the laws of Ohio; authorized capital, \$100,000. Incorporators: D.

W. Alexander, Charles L. Rempes, Samuel A. Messner, W. F. Wotring and W. L. Keller. To manufacture automobile tires and accessories.

Reliance Tire & Rubber Co., June 3, 1915; under the laws of New Jersey; authorized capital, \$50,000. Incorporators: Cornelius D. McGiehan, 2 Pearsall avenue, Jersey City, New Jersey; Guy W. Lindsay, 236 Washington street, and Elmer E. Burdick, 115 Broadway, New York City. To manufacture, sell, import, export and otherwise deal in tires made wholly or partially of rubber and fabric, and generally deal in and manufacture tires for vehicles.

Savoie Rubber Co., June 2, 1915; under the laws of Massachusetts; authorized capital, \$50,000. Incorporators: Joseph Savoie and Charles T. Roy, Central Falls, Rhode Island, and William G. Burns, 27 State street, Boston. To manufacture and deal in articles made of rubber, in whole or in part, and in compounds, compositions or mixtures containing rubber in any form.

Solo Tire Co., Inc., June 12, 1915; under the laws of New York; authorized capital, \$100,000. Incorporators: John W. Suling, 107 West Eleventh street; Lavinia Leitch, 226 West One Hundred and Twenty-third street, New York City, and Evelyn F. Price, 439 East Eighth street, Brooklyn, New York. To manufacture tires and auto parts.

Spitler Puncture Plug Co., Inc., May 25, 1915; under the laws of New York; authorized capital, \$4,950. Incorporators: Joseph B. Dulany, Hotel Anderson, 102 West Eightieth street; Thomas N. Tull, West Washington Market, New York City, and John Spitler, Port Washington, New York. To manufacture bicycle accessories, tire plugs, automobile supplies, etc.

Supreme Tire & Rubber Co., Inc., June 11, 1915; under the laws of New York; authorized capital, \$10,000. Incorporators: Herbert T. Mahan, Cold Spring Harbor; Baldwin C. Young, Huntington, and Robert S. Sneyly, 81 Macon street, Brooklyn—all in New York. General tire and rubber goods manufacturing business, auto. equipment, etc.

Tire Sales Co., Inc., May 4, 1915; under the laws of Maryland; authorized capital, \$5,000. Incorporators: Arthur P. Mosby, Carolyn B. Donley, W. F. Kempel Jones. Location of principal office, Baltimore, Maryland. To sell automobile tires, tubes and accessories, etc.

Trent Raincoat Co., June 3, 1915; under the laws of New Jersey; authorized capital, \$50,000. Incorporators: William O. and Arthur J. Anderson, and Frances E. Quigley—all of Trenton, New Jersey. Location of principal office is at the plant of L. M. Anderson Co., New York avenue, Trenton. To make, purchase and sell raincoats, waterproof garments of all descriptions, etc.

Traveller Tire & Tube Co., Inc., June 16, 1915; under the laws of New York; authorized capital, \$50,000. Incorporators: Samuel Marx, 233 Broadway; Louis M. Barman and Louis Bayer, 117 Leonard street—both in New York City. To manufacture tires and rubber goods.

United States Rubber Co. of New England, May 13, 1915; under the laws of Massachusetts; authorized capital, \$50,000. Incorporators: William H. Porter, 110 Federal street; Clarence L. Weaver, 77 High street, and Henry C. Kalish, 218 Congress street—all in Boston. To deal in rubber goods and footwear of all kinds.

Vulcan Recovery Co., May 21, 1915; under the laws of New Jersey; authorized capital, \$150,000. Incorporators: Herbert Wright Backes, J. Conner French and Jerome Klinkowstein—all of Trenton, New Jersey. Location of principal office is May street, Township of Ewing, Mercer County, New Jersey. To refine and reclaim crude rubber and waste materials, and to manufacture and compound the same into raw materials to be used in the manufacture of rubber and other goods.

THE CONSULTING CO.

An organization known as The Consulting Co., with headquarters in the Central Life Insurance building, Cincinnati, Ohio, has recently been formed for the purpose of assisting rubber manufacturers in the solving of the various problems which confront them from time to time. The new company specializes in the planning of equipment, in locating defects in factory operation, and in increasing manufacturing efficiency. The company has three principal departments, under the respective captions of Mechanical, Laboratory and Experience. The mechanical department is in charge of B. L. Baldwin, a mechanical engineer and a member of a number of recognized engineering bodies, including the American Society of Mechanical Engineers. This department covers plans, specifications, building structure, machinery, power economy, estimate of cost, the economical placing of equipment and such other matters as pertain to the operation of a rubber plant.

The laboratory is under the direct personal supervision of Joseph W. Ellms, a member of the American Chemical Society and the American Society of Civil Engineers. The province of this department is to supply analysis of raw material, as well as of finished product, and to make physical tests and examinations.

The "Experience" or rubber department is controlled by W. G. Brown, who has had an uninterrupted experience of thirty-five years, covering all branches of the industry, including compounding and manufacturing, and whose specialty is to reconcile the theoretical tendencies of engineering and chemistry with the limitations and needs of rubber manufacturing.

THE FIRESTONE TIRE IN MOTORCYCLE RACING.

Racing in the form of hill-climbing contests is now interesting motorcycle riders, and an event of this class at Philadelphia on Decoration Day, a 500-yard stretch of dirt road with a 20 per cent. grade was covered by the winning



machine—equipped with Firestone tires—in 14 seconds, or at a rate slightly better than a mile a minute. The accompanying cut illustrates the event, which was witnessed by upwards of 3,000 spectators.

Firestone tires were also used by the winner of the 150-mile motorcycle race in California, May 30 and 31, as well as by the successful candidate in a similar race of 200 miles on the latter date at Phoenix, Arizona. Neither rider experienced any tire trouble in these contests, although the rear tire on each motorcycle had been in previous use in the 300-mile race at Venice, California, on April 4.

TRADE NEWS NOTES.

The Portage Rubber Co., whose "Daisy" tread tire has become familiar to so many automobilists, is reported to have purchased property at Barberton, Ohio, where its present plant is located, on which it will erect a fine new factory. This company is running day and night, the capacity of the plant now occupied being insufficient to take care of immediate demands.

An association has been formed by employees of the Federal Rubber Manufacturing Co., of Milwaukee, Wisconsin, under the direction of the welfare department of the company, to be known as the Federal Rubber Employees' Association. Nominal monthly dues are charged, and each member is eligible to sick or death benefits. The work of the welfare department of this company is said to have effected a 75 per cent. reduction in accidents among operatives.

The Pennsylvania Rubber Co., of Jeannette, Pennsylvania, has moved its Philadelphia office, of which George Blair is manager, from 651 to 306 North Broad street.

J. Goose & Co. have taken over the scrap rubber business formerly conducted by Goose-Broidy Co., at 100 Pearl street, Chelsea, Massachusetts, the partnership arrangement between J. Broidy and J. Goose having been dissolved.

At a special stockholders meeting of the Goodyear Tire & Rubber Co., held at Akron, Ohio, June 1, the proposed capital stock increase, as mentioned on page 513 of our June issue, was duly authorized, and a resolution was adopted by which \$1,700,000 of the new stock was set aside for sale to employees; \$250,000 being intended for immediate distribution.

At a regular meeting of the board of trustees of the New York Rubber Co., held at the company's offices at 84 Reade street, New York City, June 9, Christopher W. Wilson was elected to fill the vacancy on the board caused by the death of John P. Rider.

The Vulcan Recovery Co. has been organized at Trenton, New Jersey, with \$150,000 capital stock, to conduct a crude rubber refining and reclaiming business. The incorporators are Herbert W. Backes, J. C. Frank and Jerome Klinkowstein.

In the settlement of the affairs of the Walpole Tire & Rubber Co., of Walpole, Massachusetts, 115 stockholders of Providence and vicinity, representing from 1 to 871 shares of common stock and from 1 to 167 shares of preferred stock—which before the failure of the Atlantic National Bank involved the company in financial difficulties had been paying 4 and 7 per cent. dividends, respectively—will lose the entire amount of their investments.

Charles H. Franks and Frederick V. Roesel, of the Ott-to No Air Tire Co., of Akron, Ohio, and inventors and patentees of a new type of core for a resilient wheel, to promote which the company was organized, are reported to have applied for an injunction against George M. Ott, to restrain him from disposing of his stock in the company. The complaint charges that the financial assistance promised by Ott in return for a half interest in the company has not been forthcoming, and the return of the stock is demanded.

WATERMAN CO. ACTIVITIES.

The L. E. Waterman Co., which manufactures the Waterman fountain pen, opened its fourth factory, at 163 Front street, New York, late in May, the occasion being marked by a luncheon served to 300 guests, of whom more than 200 were members of the New York Rotary Club.

Employees of the Waterman company, to the number of 600, attended an outing on June 12 at Rockland Lake, New York. Athletic games and dancing, with luncheon and supper, were included in the entertainment. The trip was made on a special train, and a band headed the first division of 100 employees, known as the "Ten Year Club," who have been in the firm's employ for at least ten years. Another delegation was from the "Health and Happiness Club," composed of young women employees.

THE OBITUARY RECORD.

FRANK A. MAGOWAN.

A MOST extraordinary career came to a tragic end when, on June 27, Frank A. Magowan died, of cerebral hemorrhage, at St. Mary's Hospital at Hoboken, New Jersey. He had been found lying unconscious in the street nearly a week earlier and after being taken to the hospital only regained

consciousness long enough to tell who he was. His son, Donald, of Trenton, was notified and immediately went to Hoboken and saw that everything possible was done for his father's comfort. The funeral, which was private, was held from Donald Magowan's home in Trenton. Four children, Donald, Spencer and Frank, of Trenton, and Mrs. W. W.



F. A. MAGOWAN.

Burden, who lives in Astoria, Long Island, survive him.

Mr. Magowan's career in the industrial world, though comparatively brief, was exceedingly brilliant. From about 1886 to 1894 he was the head and front of the commercial and political life of Trenton. He was elected Mayor of the city and was prominently mentioned for the governorship of the state. He was a man of wonderful physical force and untiring energy, and everything he undertook seemed immediately to succeed. He was born in Trenton about 55 years ago and after graduating from the public schools became a salesman for his father, Allan Magowan, who had been identified with the rubber industry for some years.

It may not be out of place to devote a few lines to the elder Magowan. He was a man of sterling worth in every way, and his association with the rubber industry extended over a period of 60 years. He became connected in 1850 with the New England Car Spring Co., located in New York. At the outbreak of the Civil War he was associated with the New Jersey Car Spring & Rubber Co. in Richmond, and, being known to be a rubber expert, he was impressed by the Confederate government into its service and among other duties was directed to make torpedo fuses. But being a very strong Union man and having taken no oath to the Confederacy, he saw to it that his fuses would never harm the Union forces, for he carefully punctured them all before they were covered with insulation. After a year or so he secured a permit to come North as an exchange prisoner. He accumulated quite a fortune, which, however, in the later '90s was swept away in the financial troubles in which his son became involved. But later he established another rubber factory in New Jersey and continued his connection with it until his death in 1911.

Frank Magowan first became identified with the rubber industry in an important way in 1880, when, with his father and two others, he incorporated the Trenton Rubber Co. One rubber company, however, was not enough for his growing ambition, and very soon he incorporated two additional rubber manufacturing companies, one the Empire Rubber Co., the other the Eastern Rubber Manufacturing Co. But no one industry could

monopolize his exhaustless energy. Early in the '90s he had become president of the Central Jersey Traction Co., which was formed to project a through line of electric railway from New York to Philadelphia, president of the Trenton Watch Co., general manager of the Trenton Potteries Co., president of the Trenton Oil Cloth Co., beside controlling several other large and successful industrial concerns.

But in 1894 his fortunes took a sudden turn. At that time the foreman of one of his rubber mills brought an alienation suit against him, and in the following year Mr. Magowan and the woman involved disappeared from Trenton and were located some time later in Oklahoma. From that time on his fortunes were as rapid in their decline as a few years earlier they had been in their upward course. In the next three or four years all the large interests he had secured became dissipated. In 1898 he sought to retrieve his place in the business world by forming a \$10,000,000 syndicate of rubber plants, but in this he was unsuccessful. A few years later, in 1905, he took out a patent on a flexible inner tube which was to revolutionize the tire industry, and in the same year he incorporated the Pneumatic Ball Tire Co., with an authorized capital of \$3,000,000. But this did not materialize into an active company.

In fact, from the time of his abrupt leaving of Trenton in 1895 he never was able to rehabilitate himself in the industry in which for some years he was such a dominant figure.

Mr. Magowan was a man of unusual type and varied characteristics. His ability as a worker and organizer was great, but his appetites were greater—so much so that once in control they wrecked him financially and physically. A millionaire at twenty, a waif at fifty, is a sad record. His friends—and he had many, too—often voiced the belief that with all of his brilliancy, he was not quite responsible, and that is perhaps the most charitable and reasonable way to view his varied and stormy career.

ADOLF GREGOR SPEYER.

Adolf Gregor Speyer, founder and partner of Speyer & Grund, Frankfort-on-the-Main, died on May 14 last. Mr. Speyer was 80 years old, and had been actively connected with the rubber industry for the past 20 years.

JAMES W. KELLEY.

After an illness of several months, James W. Kelley died at his home in Framingham Center, Massachusetts, June 9, at the age of fifty-five.

Mr. Kelley went to Akron as a young man of twenty-two and became a clerk in the office of The B. F. Goodrich Co. He gradually worked his way up to an official position in the company. Even as a young clerk, he had the greatest confidence in the future of the Goodrich company and invested all his spare savings in its stock. He even borrowed money for this same purpose, and as a result in time became one of its large stockholders, and with the great increase in the value of his holdings, he became a man of considerable wealth.

After remaining with the Goodrich company for twenty-five years, he retired from active work eight years ago, devoting two years to foreign travel with his family. He then returned and made his home in Framingham Center, Massachusetts. During his career in Akron, he found time for church work and charitable enterprises, and also served on the Akron Board of Education. After his return from his travels six years ago, he devoted himself very largely to philanthropic work.

His wife was Miss Nettie Ferriot, of Akron, who, with a daughter, Louise, survives him.

GEORGE H. KENDRICK.

George H. Kendrick, president of the Massachusetts Packing & Belting Co., of Boston, lost his life in the accident in Long Island Sound on June 13, when the Metropolitan Line steamer "Bunker Hill," on which he was returning from a building trades convention at Atlantic City to his home in Quincy, was rammed by the yacht "Vanadis," owned by C. K. G. Billings.

The collision occurred during a dense fog, the bowsprit of the "Vanadis" crashing into his stateroom and killing him almost instantly.

Mr. Kendrick was born in Quincy, Massachusetts, 45 years ago and was well known in the eastern mechanical goods and mill supply trades. He was at one time associated with the H. W. Johns-Manville Co., later becoming manager of the Boston office of the Crandall Packing Co., of Palmyra, New York. This position he held for five or six years, retiring a few months ago to form the Boston Packing & Belting Co., with offices at 141 Milk street. He is survived by his wife and one child, a daughter ten years of age.

ELIJAH KENT HUBBARD.

Elijah Kent Hubbard, formerly president of the Russell Manufacturing Co., manufacturers of fire hose of Middletown, Connecticut, died of heart disease in that city, June 27, in his eightieth year. He is survived by three sons and two daughters.

TRIBUTE TO THE LATE JOHN D. VERMEULE.

At a meeting of the board of directors of the United States Rubber Co., held June 17, President Samuel P. Colt called attention to the death on May 18 of John D. Vermeule, director of the company. On motion of Vice-president James B. Ford, seconded by Henry L. Hotchkiss, the following minute was unanimously adopted:

John D. Vermeule, whose death occurred on May 18, 1915, had been a director of this company since May 18, 1897, and for three years, commencing May 20, 1898, he was a member of the Executive Committee.

Mr. Vermeule became connected with the Goodyear's India Rubber Glove Manufacturing Co. in 1870, and in 1882 was elected president of that company. It thus appears that his relation to the rubber footwear business and to one of the most successful of the subsidiary companies of this company had extended for a period of forty-five years.

He was a man of sterling character, fair minded, kind and unselfish, and he endeared himself to his fellow directors and to his employees. His associates on this Board will ever remember him with high respect and warm regard.

PERSONAL MENTION.

Ernest E. Buckleton, president of the Northwestern Rubber Co., of Liverpool, in a personal letter to a friend in the United States, says, "I am still looking after Belgian refugees and intend to as long as I can, although funds are very low. The Rubber Club's donation was a Godsend and the Belgians often speak of the goodness of the Club."

K. E. Kersten has been appointed Chicago branch manager for the Boston Belting Co., located at 172 West Randolph street, where an assortment of all the well known brands of belting, hose and packing made by the company is carried.

Pedro Demoraes-Sarmiento and wife, of Pará, Brazil, arrived in New York last month on the steamship "Sao Paulo." Mr. Demoraes-Sarmiento is an active member of the firm of Palma & Sarmiento, *aviadores*, of Pará.

E. H. Clapp, of the E. H. Clapp Rubber Co., Boston, has been elected a member of the Legislative Committee of the Rubber Club.

Samuel A. Foot, who has been connected with the druggist sundry business, as salesman, buyer and manager, for the last 24 years, has become associated with McKesson & Robbins, New York.

John J. Boyle, who for the last 5 years has been connected with the Gutta Percha & Rubber Manufacturing Co., of New York, has joined the sales force of the New Jersey Car Spring & Rubber Co.

The June number of this publication contained an obituary notice of the late Arthur R. Foley one of the victims of the sinking of the "Lusitania," who had been connected as a salesman with the Home Rubber Co., of Trenton, New Jersey, for a long time. The trade in the particular territory covered by Mr. Foley

will be interested to know that his son, J. B. Foley, also one of the Home company salesmen, will visit the customers to whom his father was so long a familiar figure.

TRADE NEWS NOTES.

Honorable Victoriano Huerta, ex-provisional president of Mexico, who has established his summer home at Forest Hills, on Long Island, New York, has selected Ajax tires, the product of the Ajax Rubber Co., of Trenton, New Jersey, for the equipment of his automobiles.

The Scrap Rubber Division of the National Association of Waste Material Dealers held its quarterly meeting June 14 at the Hotel Astor, New York. Paul Loewenthal, of The Loewenthal Co., 37 West Thirty-ninth street, New York, is chairman of this division.

The Steel Pneumatic Tube & Tire Co. has removed its sales rooms, formerly located at 1853 Broadway, to its factory at 146 West Fifty-second street, New York.

At the annual meeting of the stockholders of the Quality Tire & Rubber Co., of Hartville, Ohio, held May 29, it was decided to increase the capital stock from \$75,000 to \$500,000. The subject of plant enlargement was also considered, but it was decided to defer the commencement of this work until next spring. The present plant, which has been in operation since last Fall, has a capacity of 200 tires a day.

At this meeting John C. Harmony was elected president and C. E. Bair secretary and treasurer. The board of directors includes Oliver Brumbaugh, Hiram Carper, John C. Harmony, M. E. Herr, G. F. Munk, Frank Schumacher (former president), and William Wagner.

At a meeting on June 15, of the directors of the Standard Tire & Rubber Co., of Willoughby, Ohio, it was decided to increase the capitalization of that company from \$100,000 to \$500,000. The work of installing machinery at the factory recently acquired by this concern, and which was formerly occupied by the American Fork & Hoe Co., has commenced, five carloads of new equipment arriving in Willoughby on June 15.

The plant of the Century Rubber Co. at Plainfield, New Jersey, has been sold at public auction to Leon Jaffess, of New York and Harrison, New Jersey, for \$29,000.

The Portage Rubber Co., of Akron, Ohio, has added a new tire tread to its line, under the registered name "Safegrip."

The Federal Rubber Manufacturing Co., of Milwaukee, Wisconsin, has moved its Detroit branch—of which A. L. DeVault is manager—from 846 Woodward avenue to 247 Jefferson avenue, east.

The D. L. Davis Manufacturing Co., which manufactures tire pumps and other accessories, with plants at Chicago and Milwaukee, is reported to have received a site at Fort Madison, Iowa, for another factory. C. W. Tarbet, president of this company, is also president of the Perfection Tire & Rubber Co.

The Kansas City Tire & Rubber Corporation has been formed at 22 William street, New York, with \$335,000 capital stock, by Leopold M. Lehr, Ralph Atkins and Joseph A. Arnold, to manufacture tires and other rubber goods.

The Miller Rubber Co., of Akron, Ohio, has established an agency for its tires at Des Moines, Iowa, with the Schooler Rubber Co., at 1020 Locust street.

The Kansas City Tire & Rubber Co., with offices at 1111 Commerce building, Kansas City, Missouri, is among the new western rubber companies. The manager is W. W. Wuchter, formerly of the Swinehart Tire & Rubber Co., Akron, and more recently factory manager at the Gibney Tire & Rubber Co., Conshohocken, Pennsylvania.

The Schelp-Budke Tire & Rubber Co., St. Louis, Missouri, has recently taken the agency in the territory adjacent to that city for the tires made by the Gibney Tire & Rubber Co., of Conshohocken, Pennsylvania.

MR. MARKEY CELEBRATES HIS 82ND BIRTHDAY.

Isaac Belknap Markey, vice-president of the Eureka Fire Hose Manufacturing Co., of New York, who recently celebrated his eighty-second birthday, has been connected with the fire hose industry for 43 years, for 25 years of which time he was a traveling salesman. He has occupied his present position in the Eureka company for a number of years. Mr. Markey is one of the best known supply men in the country, and the appreciation in which he is held among fire department heads was fittingly evidenced in the presentation to him at an International Fire Association meeting a few years ago of a diamond-studded badge.

COLONEL COLT'S ANNUAL CAMPING PARTY.

Following his custom for a number of years past, Col. Colt spent ten days of June at Camp Colt, his hunting lodge, at Norcross, at the foot of Mt. Katahdin, Maine. He left Bristol with his party in a private car on the first of June. His guests this year included Walter S. Ballou, president of the Woonsocket Rubber Co., and Nathaniel Myers, counsel for the United States Rubber Co. The other members of the party were his brother, Senator LeBaron B. Colt; Reverend Dr. George L. Locke, Mr. and Mrs. Wallis E. Howe and Mr. and Mrs. Andrew Weeks Anthony, of Bristol; Mr. and Mrs. E. A. Barrows, Colonel and Mrs. H. J. Gross and Mrs. William Beresford, of Providence; Countess Elinor Moroni, of Montreal, and Dr. Calvin S. May, of New York.

MR. IVINS' HEALTH DELAYS ACTION IN RUBBER SUIT.

It was expected that the action brought by William A. Evans, as trustee, against the Rubber Goods Manufacturing Co. to settle certain differences over stock subscriptions would come before the Supreme Court of New York in June, but it had to be postponed owing to the health of Mr. William M. Ivins, the chief witness for the defense. Mr. Ivins' physician sent an affidavit to the court saying that, owing to the extremely laborious work that devolved upon him in the libel suit which he conducted for William Barnes against Col. Roosevelt, he had suffered a collapse. Mr. Ivins in his affidavit said: "I began the preparation of the case of Barnes against Roosevelt about the first of this year, and concluded the trial at Syracuse May 19, the whole matter having been a long and exceptionally heavy strain upon me."

COMMODORE BENEDICT ENTERTAINS MUSICIANS.

Commodore Benedict gave a luncheon on June 9 at his residence at Indian Harbor, near Greenwich, Connecticut, to the Mendelssohn Glee Club, of New York City. Eighty-four members of the club—who were carried from New York to the Commodore's home and back on his famous yacht, the "Oneida"—together with 50 other guests, were present.

WAS MULLER, THE SPY, A RUBBER MAN?

Several weeks ago F. Robert Muller was arrested in London, together with two other men, Hahn and Kuepferle, all being accused of acting as spies for Germany. They were convicted of sending military information by means of invisible ink. Hahn was sentenced to seven years' penal servitude; Kuepferle committed suicide during the progress of the trial, and Muller was sentenced to death. He was executed June 23 in the Tower of London.

It has been generally believed that this was the same F. Robert Muller who was a rubber dealer in Boston a few years ago, first being connected, very briefly, with one of the larger importing houses and then operating as a dealer on his own account. Friends of the former rubber dealer maintain, however, that he is not the man recently executed and show, in substantiation of their contention, a letter received by a Boston lawyer about a month ago from the Muller formerly of Boston saying that he was a private in the British army.

MR. LOEWENTHAL ENGAGES IN CHARITABLE WORK.

A DEPARTURE from the usual methods in the collection of funds for charitable purposes is noted in the work of The United Hebrew Charities of the City of New York. This organization maintains an industrial department at 37-39 Greene street



MAX LOEWENTHAL.

which has recently started a movement to increase the funds for relief of the needy by the collection of waste materials. The chairman of the committee in charge of this work is Max Loewenthal, vice-president of the U. S. Rubber Reclaiming Co., Inc., of 30 East Forty-second street, New York. Under his direction this work of collecting waste materials and selling them to the mills will no doubt result in material assistance to the poor.

The plan adopted in this work is simple. Cotton bags are sent to householders, accompanied by letters requesting that all kinds of old materials, such as old rubber goods—water bags, rubber hose, rubber shoes, wringer rolls, etc.—be saved. An addressed card is enclosed in each letter, so that when the bag is full the Department may be notified to call for it.

Apart from the charitable purpose for which this enterprise has been started, employment is thus given to numerous collectors and others, and economic waste is avoided. Up to the middle of June several thousand of the 25,000 bags distributed had been returned.

Mr. Loewenthal has been an important figure in rubber reclaiming for many years. Together with the late Theodore S. Bassett, he founded the United States Rubber Reclaiming Works, at Shelton, Connecticut, in 1895. When, in 1900, this company was merged with the Loewenthal Rubber Co. of Jersey City, and the combined corporation, under its present name, the U. S. Rubber Reclaiming Co., Inc., was moved to the large plant in Buffalo, New York, which it has since occupied, he became the treasurer, later being elected president. But two years ago, while retaining a directorship and the vice-presidency of the company, he retired from active participation in its affairs, in order that he might devote the greater part of his attention to charitable work.

The J. Spencer Turner Co., of 86 Worth street, New York, agent of the International Cotton Duck Mills and also of the Mt. Vernon-Woodbury Cotton Duck Mills, has been advised by the latter concern that after July 1 it will sell all its product direct to the trade. The product of these mills consists largely of wide duck, numbered duck and sail and army duck. The J. Spencer Turner Co. will, however, continue the sale of hose and belting duck, together with the various kinds of duck and fabric used by the rubber trade and made at the International mills.

Robert B. Baird, of the Rubber Trading Co., of New York, who with Mrs. Baird has been taking a vacation tour of the West, viewing the sights of the Panama-Pacific Exposition, among other things, is expected to return to New York on the 10th of the month.

HOOD RUBBER CO. OUTING.

THERE were thousands of sad faces in and about Watertown early Thursday morning, June 17, which is the date of the anniversary of the Battle of Bunker Hill, and a legal holiday. The Hood Rubber Co. had made extensive preparations to celebrate that day by giving an outing to its employees. Riverside Recreation Grounds had been pre-empted, special trains arranged for, bands hired, a program of sports and contests prepared, hundreds of prizes bought, and so many tickets distributed that the committee lost count. And then it rained!

How it rained! It looked that morning as though the six inches of rain, which Boston is shy, would be made up in that one half day. But the shower was not of long duration, and the clearing skies brought out a large attendance. Four thousand persons, each wearing a big blue tag, passed the turnstile. There were old men and children, young men

ball diamond, the tennis courts, the indoor gymnasium, the swimming bay, the race track, the river race course, the bowling alleys and the dance hall were all in constant use.

And from one o'clock till dark things were humming. Out in the baseball field the "Red Sox" and the "Braves"



FOOTBALL TEAM.

the former with proper colored hosiery to deserve the name; the latter with war paint, feather head-dresses and tomahawks—played ball. The score, according to the grandstand fans, was 10 to 2 in favor of the "Red Sox."



GIRLS' FOOT-RACE.



MEN'S FOOT-RACE.

and maidens, for the invitations included the whole family of each employee.

They came prepared to have a good time. There were sports and games galore—contests, with prizes ranging from a gold

Then there was a Gaelic football game between the calender lay team and the calender night team, which was won by the latter. The single men and the married men had a try at baseball, but the scores got away while your correspondent was watching a lively tug-of-war, participated in by Millwrights, Carpenters, Makers and State, which resulted in a victory for the States, the five happy men winning gold fobs bearing the Massachusetts State seal, surrounded by the name of the company.

Everywhere, all over the big lot (he seemed to be ubiquitous), was Tom Keating, the clown, with whitened face and yellow costume. He was funny, but besides he was a fine athlete, and his comedy stunts were as marvelous as they were laughable.

There were gymnastic contests, too, and Punch and Judy for the children—a real English Punch and

Judy, with the genuine Cockney accent.

Speaking of accents, there were several, as notice the names of contestants—English, Irish, Scotch, French, German, Italian,



TUG-OF-WAR.

watch to articles for comfort and adornment. To tell all that was going on would have necessitated your reporter's presence in three or four places at once, for the football field, the base-



STRONG MAN.

Russian, Polish, Armenian, Syrian and Persian. Americans, hyphenated Americans and foreigners were all one big family, out for a good time; and they had it.

Every contestant for any event had a card pinned to his or her back, with a number in figures six inches high, and everybody entering the grounds had a list telling to whom each number was pinned. It served as an introduction.

The list of contestants is too long to

A. Howes; tennis, men's singles, L. Beane; quarter-mile canoe race singles, J. Higgins, half-mile canoe race, doubles, Hawkins and Hawthorne.

And after the sports there was dancing, to the music of the Waltham Watch Co. band; canoeing on the Charles river under electric illumination, and later the trip home on special trains, special automobile trucks, and special trolley cars.

Several of the officers and executives, also members of the selling force, participated in the celebration. Great credit should be given the executive committee—



TOM KEATING, THE FUNNY MAN.

be given in full, but among the successful contestants special mention should be made of Mary Viveiros, who works in

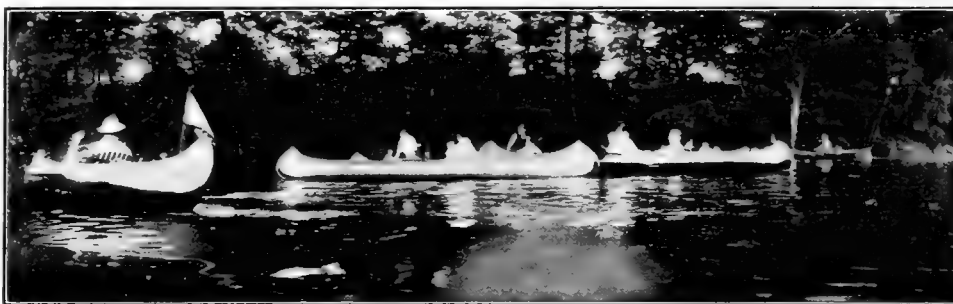
the quarter room, who carried home eight or ten prizes, also of Paul J. Kanaly, in the construction department, and Elsie J. Kanaly, his sister, in the production department, who won a variety of useful and ornamental

prizes. The following is a list of winners in the chief events:

One hundred-yard dash, W. Cleophus; one mile run, H. J. Davkin; running broad jump, A. J. Landing; running high jump,

Dr. R. S. Quimby, chairman; C. W. Johnson and H. L. Baxter—and the members of the various other committees are each and every one entitled to praise for the perfection of the arrangements and the smoothness of the day, which passed without

accident or untoward incident. The Hood Rubber Co. will profit, in the increased loyalty and appreciation of its thousands of employees by this generous celebration.



CANOEING ON THE CHARLES.

RUBBER BONDS OVER-SUBSCRIBED.

The \$9,000,000 five per cent. debenture gold bonds of the General Rubber Co. offered investors through the First National Bank and Central Trust Co. of New York on June 10 were over-subscribed within a few hours of the opening of the books.

THE HEWITT RUBBER CO

The Hewitt Rubber Co., Buffalo, New York, is one of the best equipped and most successfully operated rubber manufacturing concerns in the trade. The buildings are modern, and the equipment includes an elaborate system of testing laboratories and an electrically operated power plant, which includes fuel and ash-handling devices. The Hewitt product comprises various types of railway, fire and navy hose, pure sheet for port-hole rubbers, rubber belting and a general line of mechanical goods. This company has for a number of years had large contracts with the government for rubber naval supplies, from which a high standard of work may safely be assumed. It recently received a large hose contract from the city of Pittsburgh, Pennsylvania. The officers of the company are: H. H. Hewitt, president, and W. C. Mellett, secretary. Frank H. Van Derbeek is the manager of the plant, and E. H. Openshaw superintendent.

BUYING AMERICAN AUTOS AND TIRES FOR SERBIA.

Col. Yeverem Popovitch, of the Serbian artillery, and two other representatives of the Serbian government, arrived in New York on June 19 on the Greek steamship "Themistocles," with the expectation of making a tour among the large manufacturing plants of this country which make military supplies. Col. Popovitch states that the Serbian government has ordered \$120,000 worth of American automobiles, and expects to order a quantity of American automobile casings, as they have found that the motor cars and tires made in this country give better service than those made in Europe.

PLYMOUTH RUBBER CO. BANQUET.

The banquet given at the City Club, Boston, on the evening of June 9, by the Plymouth Rubber Co. to heads of departments and members of its sales force, clearly demonstrated the growth of this company since its establishment less than 20 years ago. At that time the total number of persons employed was 5, whereas more than 60 attended the banquet as department heads and sales representatives, while 500 are employed in the factory at Canton, Massachusetts. The product of the Plymouth Rubber Co. consists of rubberized materials and sheetings, in addition to the "Durable-Kompo" sole and the "Slipknot" heel.

THE RUBBER TRADE IN BOSTON.

By Our Regular Correspondent.

THERE is little that is new to be said of the business situation, as far as the rubber business is concerned. However, there is a feeling all through the trade that things are just a little better than they were a month ago. The New England States have not had their quota of rain this spring—they are six inches behind the record, and this is making an impression on the garden hose business, which is better, and the rubber garment trade, which is worse. The mill trade continues unsatisfactory in some respects; purchasing agents of the big manufacturing companies still pursue their policy of buying only as needed, rather than carrying supplies on hand. The boot and shoe men report that many of their northern New England customers have ordered in much smaller quantities than last year. There are somewhat divergent reports regarding the demands for rubber heels and soles, some producers telling of increasing business, while others are less enthusiastic. The same may be said of the automobile tire business.

But the general feeling is one of gradually returning confidence and a belief that from now on there will be a heavy and a steady increase in business.

* * *

There are some good golf links around New York, but when real golf enthusiasts want the best, they come to Boston. Early last month George B. Hodgman, president of the Hodgman Rubber Co., and Henry C. Pearson, editor of THE INDIA RUBBER WORLD, having a desire for more links to conquer, came over to Boston, and with Messrs. J. H. Learned of the Revere Rubber Co., and Frederick H. Jones of the Tyer Rubber Co., chased the little white balls around the Brae Burn Club course in Newton. The score will not be published here, for fear of increased handicaps at the outing of the Rubber Club, to be held this month at Lowell. However, the New Yorkers were satisfied that this golf course was one well worth playing.

* * *

The members of The Rubber Club of America, Inc., anticipate a royal good time at the outing to be held July 14. The committee in charge gives out most enthusiastic prophecies of a program which will outdo any previous affair of the kind in the annals of the club. The location chosen is ideal, and the details of the day's program are sufficient to insure a good attendance and an enjoyable outing.

* * *

On Friday, June 4, a serious fire occurred at the King Rubber Co.'s plant at Hyde Park, caused by the ignition of bisulphide of carbon in the curing room, which set fire to the woodwork. The flames reached a number of tanks of gasoline, some of which exploded, thus spreading the fire to the entire structure. Owing to the quick action of Superintendent McDonald the 18 employees—eight of them women or girls—escaped without injury. The building was a one-story wooden structure, owned by the Metropolitan Raincoat Co. but for the past year occupied by the King Rubber Co. Manager M. D. Kingsbury stated that the loss was between \$5,000 and \$10,000. The company manufactures rubber gloves and nipples. Of course the practically total destruction of the factory will interfere to some extent with the filling of orders, but it is expected that within thirty days the company will have resumed manufacture.

The accident in Long Island Sound on June 13, when C. K. G. Billings' yacht "Vanadis" collided with the steamer "Bunker Hill," caused the death of George H. Kendrick, president of the recently formed Boston Packing & Belting Co., of this city. (Further mention appears on another page of this issue.) Another sad casualty of the collision, was the injury to Mrs. Waugh, wife of A. E. Waugh, manager of the Philadelphia store of the Revere Rubber Co., of Chelsea. Mrs.

Waugh was coming to Boston because of the serious illness of her father, who has since died. As a result of her injuries it was found necessary to amputate one leg. She is understood to have rallied from the shock of this operation and to be now on a fair way to recover.

* * *

There were some distinguished Chinese visitors in Boston the middle of the month, the party being headed by Hon. Chang Chien, reputed to be the wealthiest man in China. While here the Chinese Honorary Commercial Commission visited various prominent industrial plants. One party, which included President Chang, made a visit of inspection to the American Rubber Co.'s factory at Cambridge. The interpreter was kept busy translating the questions of Mr. Chang and the answers of Superintendent Woodward, Sales Manager Greene and Treasurer Nance. It seems that, among his many enterprises, President Chang is interested in plantation rubber; so that this visit and the information supplied in reply to his questions were of special interest to him for future utilization.

The guests were shown all through the big plant of the company, pausing long enough to see a rubber shoe being made under the deft fingers of a champion maker. Superintendent Woodward promised to send that identical shoe to President Chang in China, after it had been vulcanized. The honorary commissioner took him at his word, and with his pencil indented in the soft rubber his autograph for identification, explaining through his interpreter that he should look forward with pleasure to the receipt of a shoe put together under his own eyes.

* * *

The Goodyear Rubber House, which for so many years was on School street, but of late years was near the Touraine Hotel, on Boylston street, has made another change, and is now at 20 Federal street. Manager Eldredge believes there is a better business to be done on this direct route between the South Terminal Station and the post office, hence the change.

* * *

At the regular monthly exhibition of the Massachusetts Horticultural Society in this city last month, the principal feature was a new geranium exhibited by Mrs. Lester Leland, wife of the vice-president of the United States Rubber Co. This new variety is a seedling of two of the most beautiful and costly species of geranium, and is a rich silver pink in color. The society voted to name it the "The Mrs. Lester Leland," and thus the name will be known wherever rare and beautiful flowers and plants are appreciated.

THE RUBBER TRADE IN RHODE ISLAND.

By Our Regular Correspondent.

THE rubber industry throughout this State is sailing along under full steam, with practically every plant rushed for the delivery of goods. Several of the factories have enough orders from Europe to keep them going on full time for a considerable period, and in many of the departments overtime is the rule. There is still a very general demand for competent employees, much difficulty being experienced in securing good help.

The dividend on the common stock of the Washburn Wire Co., of Providence, recently paid at the rate of 7 per cent. per annum, has been increased to 8 per cent., payment at the new rate beginning July 1, to stockholders of record on June 19. The regular quarterly dividend has been declared on the preferred stock at the rate of 7 per cent. per annum, payable July 1. The initial dividend on the common stock was declared April 1, 1913, at the rate of 5 per cent., and this was increased to 7 per cent. April 1, 1914. The local plant of the corporation is at Phillipsdale.

* * *

In the list of manufacturing, mercantile and miscellaneous

companies doing business in Rhode Island having a corporate capital of \$50,000 or more, according to the annual assessment certified by the State Tax Commission to the General Treasurer, are the following: American Electrical Works, \$70,006.31; American Emery Wheel Works, \$63,231.04; American Multiple Fabric Co., \$71,368.14; American Wringer Co., \$1,134,505.24; Atlantic Tubing Co., \$83,471; Joseph Banigan Rubber Co., \$1,338,900; Bourn Rubber Co., \$111,606.36; Collyer Insulated Wire Co., \$62,580; Davol Rubber Co., \$157,200.92; Glendale Electric Fabrics Co., \$104,775.69; Mechanical Fabric Co., \$644,981.92; National India Rubber Co., \$1,394,996.89; New England Butt Co., \$121,080; Phillips Insulated Wire Co., \$1,320,997.66; Revere Rubber Co., \$483,455.12; Tubular Woven Fabric Co., \$53,750.85; Universal Winding Co., \$68,710.72; Washburn Wire Co., \$737,881.39; Woonsocket Rubber Co., \$807,468.38.

* * *

The official announcement, made a few days ago, by Col. Samuel P. Colt, of Bristol, president of the United States Rubber Co., to the effect that the Executive Committee had voted to approve of its employees joining local militia and naval reserve companies, directly affects scores of men who are members of the Rhode Island militia or naval reserve companies.

In conjunction with this notice the National India Rubber Co., at Bristol, through its vice-president, LeBaron C. Colt, issued the following notice: "The United States Rubber Co. feels that it has an obligation to do its share toward assisting in the adequate defense of this country, especially in view of the uncertain times now upon us. The company desires to encourage all of its employees who will to join the militia and serve in that organization enthusiastically.

"As a general policy, the company will pay members of the militia their full pay during their usual annual absence at camp, and will endeavor to arrange their work and duties so that all reasonable calls upon their time by militia obligations can be readily met. It is undoubtedly true that employers in the past have discriminated against members of the militia, and also against soldiers from the regular army. It is desired to change this attitude in so far as this company may have been a party to it. The United States Rubber Co. has contributed to the fund started by the Aero Club of America for the purchase of aeroplanes for the national guard service, and the company is actively entering the field for manufacturing various aeronautical supplies, with the idea of doing its part to assist the United States Government in having unquestioned sources of supply within the boundaries of the United States."

The above announcement is in keeping with the highly patriotic stand taken by the directors of this corporation during the Spanish-American war. At that time its employees were urged to go to the front, and a large number who served in that conflict from Woonsocket received the benefit of double pay, getting their money from the government, while their families received their regular weekly wages from the rubber company.

* * *

Robert J. Bowes, for the past fifteen years manager of the Lawrence Felting Co., of Millville, has resigned, to take effect July 1. He had been connected with this concern for the past 27 years, having started with his father, the late W. J. Bowes, founder of the company, which is now owned and controlled by the United States Rubber Co. Upon the death of his father, Mr. Bowes assumed charge as manager, and has since conducted the plant. His retirement is on account of poor health.

Mr. Bowes will be succeeded as manager by George Schlosser, of Woonsocket, general superintendent of the Woonsocket Rubber Co., which means that the latter will have four plants in charge. In addition to being in charge of the Woonsocket Rubber Co.'s big shoe mill at Woonsocket and its large factory at Millville, he has had charge, during the last few years, of the L. Candee & Co. rubber mill at New Haven, Connecticut; and

now the addition of the Lawrence Felting Co.'s plant places a quartet of factories under his capable supervision.

Miss Elsie F. MacDonnell, a graduate of the Rhode Island Hospital Training School for Nurses, entered the employ of the Woonsocket Rubber Co. about the middle of June as factory nurse. Her work will be largely first aid and along preventive lines among the employees of the Alice rubber mill, Woonsocket, the Millville rubber mill, Millville, and the Lawrence felting mills, all owned by the United States Rubber Co. Her headquarters will be connected with the "rest" room, which has recently been enlarged, at the Alice mill. This mill employs 1,500, the majority of whom are young women; the Millville plant employs 700 operatives and the Lawrence Felting Co. nearly 100. The introduction of a factory nurse at the United States Rubber Co.'s mills at Woonsocket and vicinity is merely an extension of the policy that has been in force for some time in other large factories of this corporation.

* * *

Creditors and affiliated interests in this city and vicinity of the Walpole Tire & Rubber Co. are considerably interested in the recent approval by Judge Dodge, sitting in the United States District Court at Boston, of an additional dividend of 25 per cent. declared by the receivers of the concern, to be paid to the creditors. This makes a total of 50 per cent. declared to date. It is said that further dividends, sufficient to bring the total up to 85 per cent. have been promised by the receivers, as the New York creditors who purchased the property have already been allowed 85 per cent. on their claims in the adjustment negotiations for the sale of the property.

According to the receivers' statement there is cash on hand amounting to \$279,243 now available, and they expect to get between \$25,000 and \$50,000 more. Because of the opposition of creditors, Judge Dodge declined to make an allowance on account to receivers at this meeting. The receivers have already received \$32,000 and have asked for \$6,000 each additional. Counsel have already received \$23,500 and a request has been made for \$10,000 more. Since the appointment of the receivers, August 2, 1913, up to May 22 of the present year, the total receipts have amounted to \$3,503,887, while the expenditures total \$3,247,286, leaving a cash balance of \$256,601.

* * *

Former Governor Augustus O. Bourn, president of the Bourn Rubber Co., was elected president for life of the class of Brown University, 1855, at the annual reunion held in connection with the recent commencement exercises of the college, this being the oldest class to attend the graduation this month. For sixty years Governor Bourn has led in making the arrangements for the reunions of his class, and election for life was unanimously agreed upon as a fitting honor.

* * *

The Revere Rubber Co. is reported to have recently secured large orders for rubber thread for shipment to Leicester, England. The thread department of the local plant on Valley street, Providence, is rushing on an overtime schedule to keep up with the increasing demands.

Business is rushing at the American Wringer Co.'s factory at Woonsocket. The plant has the full number of employees, is working full schedule of hours and has orders ahead which promise to continue this condition for a long time to come.

A large number of shipments of tennis shoes and insulated wire from the factory of the National India Rubber Co., at Bristol, recently, has necessitated the employment of extra freight handlers at the New Haven road's freight depot in that town.

Should be on every rubber man's desk—Crude Rubber and Compounding Ingredients; Rubber Country of the Amazon; Rubber Trade Directory of the World.

THE RUBBER TRADE IN TRENTON.

By Our Regular Correspondent.

AN invention which promises to assume an important place in the manufacture of automobile inner tubes has been perfected by Eugene Van Note, of Trenton and New York. It is known as the Van Note tube splicing machine, and it does away entirely with the hand method of "turning" the ends of a tube preparatory to splicing. The present method, which is a comparatively tedious operation and distasteful to the operatives because of the liability of bruising and cutting the fingers, takes three times as long as the process perfected by Mr. Van Note. Several basic claims on the machine have already been allowed by the Patent Department. The John E. Thropp's Sons Co. will manufacture the machines on royalty.

The first machine completed has been installed at the plant of the Delion Tire & Rubber Co. The business of this company is rapidly expanding. Two more tire making machines and another vulcanizer have recently been added to its equipment.

The "jitney" trade has produced a marked increase in the demand for tires. Rubber men predict that if the jitneys increase in the same proportion for the next year or two it will tax some of the factories to take care of the business.

One well known tire manufacturer, referring to the subject this week said: "The jitney cab drivers realize that if they are to keep their cars on the go they must be equipped with high-grade tires, and this is the type most of them are buying. A jitney laid up for tire repairs loses more money than it would have cost for good tires in the first place and the owners are not slow to see this. I venture to say that thousands of old cars which were practically in storage have been brought forth and converted into jitneys."

The John E. Thropp's Sons Co., which makes rubber machinery, has accomplished an unusual feat in the erection of its new plant. This plant is on the site of the old one and the company's work was not interrupted during any part of the operation. This was made possible by erecting the new building in the form of a shell over the old structure and then gradually demolishing the old plant. The company is rushed to top speed with orders. It expects shortly to have ready for shipment a large order of tire-making machinery for a French factory. It will be necessary to send demonstrators to France with the machines, as they will be the first of their kind to be used in that country. Heretofore the French have used machines of German manufacture. The introduction of the American machines will enable the factories to operate with one man less for each machine than is required by the German make, and to turn out three times as many tires in the same time.

The Vulcan Recovery Co. is the title of a newly incorporated concern which proposes to reclaim rubber in Trenton. The officers of the new concern, all of whom are connected with the Essex Rubber Co., are: A. T. Oakley, president; Owen Moon, vice-president; C. H. Oakley, treasurer, and A. E. Moon, secretary. Reclaiming operations are to begin about July 1. A. T. Oakley, the president, was for many years general superintendent of the Alkali Rubber Co. at Akron, now known as the Akron branch of the Philadelphia Rubber Co.

A law suit which promises to be of unusual interest to the trade because of the points at issue has been instituted in Mercer Court by Mrs. Thirza Ann Foley, widow of Arthur R. Foley, the rubber salesman who lost his life on the "Lusitania." The Home Rubber Co., which employed Mr. Foley at the time of his death, and in the interest of which he was en route to England, is made defendant in the suit. The Employers' Liability Law under which the action is taken is rather liberal in interpreting

the rights of employees killed or injured in the course of their regular work. The maximum compensation allowed by law for the death of a man drawing the salary Mr. Foley is said to have drawn is \$10 per week for 300 weeks.

Courts have held that where an accident is the result of a risk reasonably arising out of the employment the employers may be held liable. It may be contended that the death of Mr. Foley was not the result of an accident within the meaning of the law.

* * *

Delegates attending the convention of the National Shoe Finders' Association, which is to be held at San Francisco, July 8-9, will be presented by the Essex Rubber Co. with handsome gold bronze watch fobs encased in four colors and fashioned in octagon shape after the old California dollar. The famous "Blue List Cobbler" is shown in relief, busily applying Essex soles. On the obverse side is the company's trade mark.

Several new members have recently been added to the Essex road force.

* * *

The Acme Rubber Manufacturing Co. and the Hamilton Rubber Co. closed their entire plants recently during the funeral services of William S. Hancock, who was part owner of the concerns. Mr. Hancock left an estate of more than half a million dollars. He was at one time State Comptroller and one of New Jersey's leading business men. The flag on Trenton's City Hall was at half mast in his honor. J. E. Meyer, of the Acme Rubber Co., was one of the pall bearers at the funeral.

* * *

General C. Edward Murray, of the Empire Rubber & Tire Co., has bought a luxurious yacht which he will use for ocean cruising.

He has christened it "Virginia."

The Empire company is making alterations and extensions to its plant, improving and increasing its producing facilities. This company is extremely busy in its tire department, which is being operated day and night, on three shifts of eight hours each. One new building is in course of erection, and a siding is being built from the Pennsylvania railroad tracks direct to the shipping room.

* * *

The Trent Raincoat Co. is the title of a newly incorporated company which will manufacture raincoats and rubber specialties in this city. The plant is on New York avenue. The incorporators are William O. Anderson, A. J. Anderson and Francis J. Quigley.

* * *

Work on the new building of the Z. Z. Tire & Rubber Co. at Yardville is being pushed with great rapidity.

* * *

It is reported that the partnership between H. Freedman and I. Fineberg, composing the Trenton Scrap Rubber Supply Co., is being dissolved, inventory being taken and stock on hand disposed of preparatory to winding up the affairs of the company, which, during the seven or eight years it has been established, has done an extensive business in the handling of this material. It is said to be the intention of both partners to continue trading independently.

Bids will be received by the Bureau of Supplies and Accounts, Navy Department, Washington, until July 13, on 2,000 feet of unlined linen hose—schedule No. 8521—and until July 20 on 1,000 feet of similar material—schedule No. 8528.



THE RUBBER TRADE IN CHICAGO.

By Our Regular Correspondent.

Conditions in the rubber trade here are somewhat improved. The rubber clothing houses in particular report a fine business, due to the fact that so much rain has fallen of late. The wet weather caught the dealers with low stocks, and the result was a rush such as had not been experienced in some time.

The Firestone Tire & Rubber Co. is the complaining witness in a suit being tried in the federal court here against a band of thieves who broke open a car filled with Firestone tires in the local freight yards as it passed through the city on its way to the West. The tires were discovered by detectives in the home of one of the looters, after they had been offered for sale.

More than ten thousand advertising men recently assembled in this city to attend the convention of the Associated Advertising Clubs of the World. One of the features of the convention was a grand parade, which represented an expenditure of more than \$100,000 for floats representing national advertisers. The Firestone company had a fine float, which received great applause as it passed the reviewing stand.

An important transaction of the month was the closing by the H. W. Johns-Manville Co. of a lease for the four-story building at the northeast corner of Michigan avenue and Eighteenth street. The lease was for a term of years at the reported aggregate rental of \$310,000. The building is in the center of the automobile row, in one of the most rapidly growing sections of the city. The structure is 80 x 165 feet, and is one of the finest of the kind in that part of the city. The main office of the company is now located at 322 North Michigan avenue, and it also has a store and service station for automobile accessories at 1428 South Michigan avenue. These two buildings are soon to be given up, however.

* * *

Business of all kinds was severely hampered early last week by a strike on both the surface and elevated lines. The strike was called so suddenly that there was no chance for preparation. However, automobiles and "jitney" busses were soon placed in operation, the additional consumption of tires in the end benefiting the rubber trade. The strike lasted two days, during which time employees of large concerns were conveyed to and from work by motor trucks sent out for that purpose.

* * *

On July 6 the Interstate Commerce Commission will hold a meeting in this city at the Hotel La Salle, for the purpose of hearing the arguments of the western railroads on why a higher rate on passenger fares ought to be granted. The increase is opposed by the rubber men, who are working hard through their various organizations to defeat the plans of the railroads, as they believe the carriers are taking advantage of a wave of popular feeling in their favor.

A movement is under way for an eight-foot waterway between the South branch of the Chicago River and the Illinois River. The purpose is to establish an all-water route from the Great Lakes to the Gulf of Mexico. New York concerns have been making extensive use of the Panama Canal, and in this manner have been able to undersell Chicago firms on the Pacific coast, owing to the fact that the water rate from New York is much less than the rail rate from Chicago, in spite of the fact that this city is about a thousand miles nearer to the destination.

At the recent convention of the National Piano Manufacturers' Association here, a movement was set on foot to organize the piano supply trades, among which are included the houses

which buy rubber tubing for use in making player actions. While no definite organization was formed, it was agreed that seven men should be selected to represent the supply trades at a meeting to be held in New York City next February, for the purpose of forming a federation of all the music trade and allied associations.

* * *

The rubber trade has sustained a loss in the death of M. F. Salisbury, vice-president and treasurer of W. H. Salisbury & Co., Inc., this city, which occurred in May. Mr. Salisbury was born at Paseoag, Rhode Island, in 1831. During the early part of his life he was engaged in various enterprises. He early showed ability as a financier, and was sent to Honduras when a young man by a group of capitalists for the purpose of superintending large mining properties. He returned from successful accomplishments in this field to engage, in 1866, in the woolen manufacturing industry in Massachusetts. In 1884 he joined his brother, William H. Salisbury, of the above-named firm, in the manufacture of leather and rubber belting and packing. He became vice-president and treasurer of the company shortly afterwards, and was an active factor in the affairs of the concern until two months before his death. He is survived by a widow, two sons, and a daughter. Henry H. Salisbury, his eldest son, who for five years has been connected with the company, succeeds him as vice-president and treasurer.

* * *

The Chicago Belting Club is becoming an active factor in the local trade and appears to be the nucleus of what may some day be a more comprehensive organization among the members of the rubber trade. The club, which is composed of the leading belting men of the city, was formed about three years ago. The meetings are held once a month, with a representative attendance. One of the questions which absorbed the attention of the members at the last meeting was the practice of some concerns in making no charge for the installation of a belt.

"No apology can excuse an evil practice of this kind," said one of the members, in telling of the discussion of the matter at the club meeting. "We feel that we are paying our men good wages all day long, and that if they do a service for somebody else, even a customer, we should have some sort of recompense."

THE RUBBER TRADE IN AKRON.

By Our Regular Correspondent.

THE rubber business in this city continues good, with the factories busy and continuing to show increases in production. In tires, the combined output of the Akron factories has been for some time, it is claimed, at the rate of 30,000 tires a day, a total never before realized, and fully one-third greater than at the same time last year. The situation in the automobile industry is expected to influence the future production of tires to a considerable extent. It is predicted that within a short time there will be only two general classes of automobiles, the high priced car and one priced at \$1,200 or less—which will probably result in a demand for three classes of tires, one of extra high quality, another of medium price and a popular-priced tire which would necessarily have to be inferior in quality to the present standard. Manufacturers here are understood to be making preparations to meet this expected demand.

An employee of one of the large companies, lately returned from Russia, is authority for the statement that Russia has placed orders for \$15,000,000 worth of automobiles in the United States, the tire equipment for which is largely the product of Akron factories.

* * *

The B. F. Goodrich Co. is operating its plant day and night, having contracts on hand which will necessitate a production of 11,000 tires a day for many weeks to come. This rate of production has been maintained since early in the year, and

means a 50 per cent. increase over the output of the first five months of 1914. This company is also increasing its output of footwear, and the new eight-story building on which work has been started will be devoted in great part to this line of manufacture. In the mechanical goods department new men have been taken on to handle the orders coming in from the railways, the first orders of their kind given out for more than a year, and therefore quite generously large. All of which appears to serve as a reasonable basis for rumors of a dividend soon to be declared on Goodrich common stock.

The manufacturing departments are not the only active branches of this large organization, however. The "Safety First" bureau is equally active. In an address to Goodrich foremen and superintendents on the subject on how accidents can be prevented, Victor T. Noonan, director of safety of the State Industrial Commission, recently stated that ten per cent. of all workmen in Ohio are killed or injured every year. It is the aim of the Goodrich company to reduce the percentage in its own factory to the minimum.

In connection with its welfare work among employees, the company has donated the property formerly occupied by its chemical department for the use of the Goodrich Athletic Association, which is composed of all the young men in the employ of the company. It has also contributed a share of the \$2,500 fund collected to convert this property into a first class baseball and athletic field. And it has lately completed an addition to its employees' restaurant, so that now 2,500 to 3,000 persons can be served in half an hour. In facilitating the work of its executive departments, new telephone service has recently been installed, so that at the present time it has in its plant 21 trunk lines, with 308 stations.

* * *

The condition of the business of the Firestone Tire & Rubber Co. is indicated by the fact that, although two large wings have recently been added to this great plant, plans have been prepared for two additional factory buildings, a representative of the company stating that: "We have got all the efficiency possible out of the present plant, and in order to get more efficiency and catch up with orders we must increase our facilities." These and other additions contemplated, to be completed during the year, will add 45 per cent. to the present factory floor space.

* * *

Mention was made in these notes in the June issue of a new rubber enterprise organized by P. E. Werner, of this city. A company has since been incorporated in New York under the name of the Kansas City Tire & Rubber Co. This company has purchased the business of the Chester Rubber Tire & Tube Co., of Chester, West Virginia, which has been in operation for the past two years, besides which it expects to take over and equip another plant in Kansas City within a very short time for the production of tires and other rubber goods. Philip Freshwater, general manager of the Chester company, is associated with Mr. Werner in the new enterprise, together with W. W. Wuchter, who has been identified with tire manufacture for the past twenty years, first with The B. F. Goodrich Co., then as superintendent in the Firestone plant, and later becoming president and general manager of the Swinehart Tire & Rubber Co.

* * *

At the Miller Rubber Co.'s plant work is being rushed on additions that will give three acres more floor space than the present accommodations afford. These include one six-story building and three one-story additions, all of which are to be completed by fall. The Miller company is considering the possibility of moving the tire division of its plant to Kenmore, ten acres along the canal, recently purchased, being in preparation for a move of this kind if it should be finally decided upon. Besides being cramped for room, the Miller plant has been at a

disadvantage in the matter of its water supply, which is obtained from wells. Such a move would leave all the Akron buildings for the sundries division, which is now so rushed that it is believed it would before long be able to completely occupy the present plant. An increased demand for surgical rubber goods and rubber gloves, in which this company specializes, has been a feature of the business of its London branch since the outbreak of the war.

Jacob Pfeiffer, president of the Miller company, who recently returned from a trip to South America, expresses his belief that "ship subsidies" is the only means by which the manufacturers of the United States can successfully compete for the trade of the South American republics.

* * *

The Goodyear Tire & Rubber Co. has announced plans for three new buildings, one an eight-story factory building, and two seven-story additions, to cost in the neighborhood of \$400,000. This company is making a special bid for foreign trade, having recently sent representatives to Buenos Aires, to Australia and to India, to establish agencies, feeling that the competition of European manufacturers who have hitherto enjoyed most of the business in foreign countries will not be hard to meet at the present time, the needs of the nations at war demanding most of the European tire output.

Reports are current of phenomenal tire production records in the Goodyear plant, with 14,394 tires as one day's output. The continued daily capacity of the plant is said to be about 12,000 tires, and, besides a large increase in the mechanical department, the additions mentioned above are intended to increase the tire capacity to 15,000 a day.

An unfortunate accident occurred at the Goodyear plant on the evening of June 9, when an explosion blew off one side and part of the roof of plant No. 2, killing one man, August Fuerst, and inflicting painful injuries on another, Harold Neiderhauser, a chemist. The damage done to the building is placed at \$2,000, and the cause of the explosion is not known.

Between 8,000 and 10,000 people from Akron and vicinity attended the annual picnic of the Goodyear Relief Association, at Cedar Point, on June 19.

* * *

The Falls Rubber Co., of Cuyahoga Falls, not far from Akron, is rushing work on its factory additions. Besides the three-story building, 80 x 200 feet in size, started late in May, a power plant is also being erected at the rear of the factory. The additions will provide space for 500 more workmen.

The Marathon Tire & Rubber Co., of the same place, expects to have its new four-story and basement plant ready for occupancy by July 10. This building covers an area of 196 x 300 feet, and will cost in the neighborhood of \$100,000.

At the plant of the Kelly-Springfield Tire Co. here both the pneumatic and truck tire forces are working day and night, sales having increased more than 85 per cent. over those of the corresponding period last year. Some minor building operations are going on at this plant.

The Swinehart Tire & Rubber Co. has recently completed one new building 65 x 100 feet, and another almost as large will be completed early in July.

* * *

The grounds of "Elmcourt," the beautiful home of A. H. Marks, vice-president of The B. F. Goodrich Co., in this city, are being still further improved. This property since its purchase a few years ago has been transformed by the introduction of trees, shrubs and flowering plants. Wells have been driven from which water is pumped to form an artificial lake stocked with fish, and on which boating is enjoyed. There is also a fine bathing pool. And now a brook is being introduced. A large trench is being excavated, banked on both sides with rocks

to give it an appearance of naturalness, and through this trench, down the sloping lawn to the swimming pool and the lake, water at the rate of 22,000 gallons an hour will be pumped, three engines and pumps having been installed to keep the fountain in motion.

E. V. Selterling, president of the Goodyear Tire & Rubber Co., was a speaker at the first banquet of the Men's Alumni Association of Buchtel College on June 12 at Young's hotel. The attendance numbered 200, including some of the city's most prominent officials.

W. F. Pfeiffer, secretary and general manager of the Miller Rubber Co., with Mrs. Pfeiffer, is now in the West on a vacation trip that will include San Diego and San Francisco.

F. I. Reynolds, who has been for several years associated with the Diamond and Goodrich companies, has resigned his position as manager of automobile tire sales for the latter company. He has given out no plans beyond those for the present summer, which is to be spent in rest and recreation.

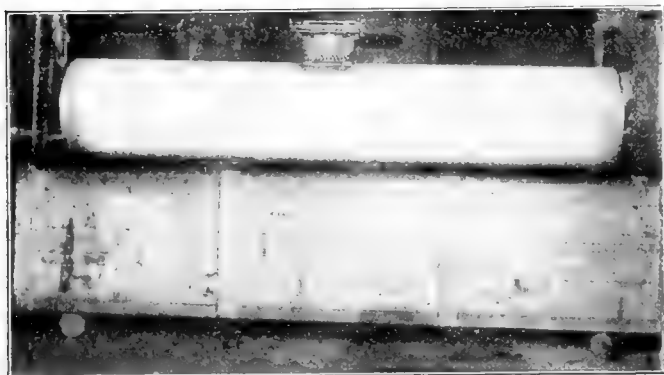
The Goodyear Aero Club, an organization composed of about 40 factory and office employees of the Goodyear Tire & Rubber Co.—most of them graduates of technical schools and interested in ballooning as a sport—recently elected E. R. Preston president for the coming year. The club has the use of the balloon "Goodyear," in which, it will be remembered, Ralph Upson and R. A. D. Preston made a winning flight from Paris in the international balloon race of 1913.

THE RUBBER TRADE ON THE PACIFIC COAST.

By Our Regular Correspondent.

AMONG the eastern exhibitors at the Panama-Pacific International Exposition now being held at San Francisco, one whose line of manufactures is well known and of special interest to the rubber trade is the General Electric Co., of Schenectady, New York. This company, which maintains a San Francisco office in the Rialto building, has two exhibits at the show, one of home electric equipment, in the Palace of Manufactures, and the other a railway exhibit, in the Palace of Transportation.

Another eastern concern whose product finds a place among the features of interest at this exposition is the Voorhees Rubber Manufacturing Co., of Trenton, New Jersey. The accompanying illustration shows an enormous typewriter roll manufactured by the Voorhees company for the \$100,000 Underwood typewriter being displayed and demonstrated at the exposition.



RUBBER ROLL FOR A MAMMOTH TYPEWRITER.

This typewriting machine is 1,728 times larger than the standard machine, and weighs 14 tons. Some idea of the platen, or roll, may be obtained by a comparison with the standard sized machine shown on top of the large roll in the illustration. This illustration fittingly demonstrates the calls made on the ingenuity and skill of the rubber manufacturer, who must be prepared for

any emergency in the use and adaptation of materials for the thousands of requirements of ever increasing diversity.

* * *

The Western Auto Sub-Casing Co., of Los Angeles, has installed a new machine built to demonstrate the advantages of tires equipped with sub-casings. This machine is intended to impose on the tire the same strain encountered in ordinary use.



It consists of two wheels, one a rasp wheel to produce friction, and the other equipped with an inflated tire, which is applied to the rasp with a degree of pressure equal to the weight of a car.

* * *

A new durable tread is now being made by the Colorado Tire & Leather Co., of Denver, Colorado. While this tread is built along the lines of the treads previously made by this company, being applicable over ordinary tires and having steel studs, it is also new in some respects. In principle the tread resembles the ordinary pneumatic casing, being held on the rim in the same way, without hooks or other fastenings. It is built up of several layers of rubberized or frictioned fabric, with a tread portion consisting of chrome tanned leather carrying steel rivets. The entire tread fits tightly over the tire, without wrinkles,

excluding water, sand, etc., and eliminating possibility of creeping or chafing.

* * *

San Francisco is now fully abreast of the times in the matter of transportation, possessing every type of car and motor bus best adapted for this purpose. In addition to the "jitney" and motor car service in the city, an interurban line has been established between San Francisco and San Mateo, and intermediate points. Specially built coaches, equipped with "Nobby" tread tires, are in use in this service.

The tire companies generally report excellent business. The Kelly-Springfield Tire Co., which only a few months ago made a central distributing agency of its San Francisco branch, is reported to have increased its sales over 60 per cent. during the first three months of the reorganization, with excellent prospects for the future. B. F. Wolff, formerly connected with the Savage Tire Co., has recently become identified with the sales force of this branch of the Kelly-Springfield company.

The Republic Rubber Co., of Youngstown, Ohio, through its coast selling organization, the Republic Rubber Co. of California, has established a direct branch at Spokane, Washington, taking over the stock of tires, belting and hose of the Interstate Rubber Co. of that city, formerly agent for the line.

The Goodyear Tire & Rubber Co., of Akron, Ohio, has appointed James E. Power San Francisco agent for its truck tires, and a service station has been established in connection with the salesroom at this point.

* * *

M. L. O'Brien, who joined the forces of the Savage Tire Co., of San Diego, the first of the year, after four years' representation of the Diamond and Goodrich companies on the coast, following three years spent in Akron rubber factories, has been promoted from the management of the factory branch to a position as assistant to the secretary of the company, in charge of sales at the home office. H. H. Eitzen, who also joined the company in January, after several years' work in various branches of the tire trade, has been appointed branch manager to succeed Mr. O'Brien.

The India Rubber Trade in Great Britain.

By Our Regular Correspondent.

AS was generally anticipated, the India Rubber Manufacturers' Association has agreed upon an advance of from 10 per cent. to 15 per cent. in the selling price of goods, thus coming into line with the action previously taken by the Silvertown company and the North British Rubber Co., Limited. This is due to a variety of causes other than the actual price of raw rubber. Expenses all around are heavier and outside of government work there is no pronounced activity. That there has been no particular rise in the value of the commodity despite large government contracts is explained by the fact that the amount of rubber being used is much the same as in normal times. It must be remembered that though large orders for ground sheets and waterproof clothing have been in evidence, the amount of rubber consumed is not large. Further, admiralty orders, which call for a good deal of rubber, are also given out quite frequently in peace times, ship building of late years having been carried on continuously. There has, of course, been a large demand for tires for the war, but this has been offset to some extent by a decreased general demand.

This reference to tires may be amplified by the remark that a recent tour in Scotland showed me the extent to which the American tire invasion is making itself felt. The present situation in the matter of European tire manufacture favors this competition. I was informed that in country districts there was a difficulty in getting supplies of certain well-known British tires, and this has led to the sale of other tires not so well known but not necessarily of less utility. One such tire which came specially under my notice was the Burnett. This is made by the Burnett Motor Tyre & Rubber Co., of Limpley Stoke, near Bradford-on-Avon. This tire, which was, I understand, brought out by Mr. Burnett when engaged at the Avon Rubber Co., Limited, has until recently been made by other manufacturers for the company, but is now being made at the company's own works which were started a few months ago.

Leaving this topic, I may note that the energetic recruiting which is going on tends naturally still further to deplete the labor market and to add to manufacturers' difficulties in departments where women and girls cannot well be employed.

The dignified rejoinder made by THE INDIA RUBBER WORLD in the editorial columns of the May issue to the attack of the "Gummi-Zeitung" has, it need hardly be said, been well received by the British rubber trade. It was, of course, written before the great sea catastrophe which at the moment is engaging the close attention of American diplomacy and was strictly in keeping with that neutrality which for so many months has characterized genuine American trade journalism.

FORTHCOMING SCIENTIFIC MEETINGS.

The British Association for the Advancement of Science is to hold its annual meeting at Manchester in September. The proceedings will be limited to business, the social functions which are always a feature of these meetings having been abandoned. It will be interesting to see whether the eminent chemists associated with synthetic rubber have anything new to say. The Society of Chemical Industry, which has many American members, also holds its annual meeting in Manchester, in July, but rubber does not so far appear in the list of subjects announced for discussion.

RECLAIMED RUBBER.

The announcement that the German Government has offered a prize of £5,000 for a successful method of regenerating old rubber is interesting if only as admitting that no really successful method is yet known, despite the various processes utilized in preparing the brands of reclaimed rubber which are now so

largely sold and used. If the ideal reclaimed rubber is obtained as a result of this offer, the price paid cannot be considered as at all excessive. High freights are at present a cause of considerable worry to those selling American reclaimed in Europe, the charge being more than six times that prevailing in normal times; and, of course, this adds materially to the selling price. As an offset to this, there is the fact that no scrap rubber is coming to England from Germany, and reduced supplies are being received from other countries; difficulties thus arising in turning out stocks of identical composition as in the past.

With regard to ocean transport, I hear that one of the important lines from America to England has refused to carry reclaimed rubber, on the ground that it is liable to spontaneous combustion. I don't know what the basis is for this statement, as I have never heard of a case with regard to the ordinary American product. I have only known of danger in connection with freshly ground crumb rubber or the sort of reclaim which is sometimes made at rubber works by heating crumb rubber with rosin oil. No doubt one result of the war will be that Germany will endeavor to supply her own requirements of reclaimed rubber. At the outbreak of hostilities one of the very largest German rubber works was buying large quantities of alkali reclaimed from England. The firm in question had previously established a plant for reclaiming on the same lines as the English company supplying it, but the venture was not a success for some reason or other.

A year or more ago I referred to the new reclaiming works being erected by the Xylos Rubber Co., Limited, at Trafford Park, Manchester. These works are now running full swing though their completion was delayed beyond the time originally anticipated. The capacity of the plant at present is about 20 tons of reclaimed rubber per week. The process employed is the modification of the alkali process according to Kugler's patent, and it is claimed for the product which is being marketed as true reclaimed rubber, that it is a distinct improvement on competitive brands and represents a new feature in reclaiming. The works, which are constructed throughout of reinforced concrete, are electrically driven by 3-phase British Westinghouse company motors, the electricity being derived from the municipal supply. All the machinery installed is of the most modern design, the elimination of manual labor being a prominent feature.

GENERAL NOTES.

The Rubber Regenerating Co., Limited, of Manchester, has presented to the British Red Cross, and is operating at its own expense, a 20 horse-power "Sunbeam" ambulance motor car.

A fire which occurred at the extensive rubber works of Charles Macintosh & Co., Limited, Manchester, on May 21, adds another to the list of similar outbreaks which have occurred in works engaged on government contracts and all of which have been due to the ignition of naphtha vapors. The fire did not assume any very serious proportions and caused no delay in the completion of government contracts.

A company known as Grimston Tyres, Limited, has been formed, with a capital of £6,000, to continue and expand the business carried on for some years at St. Albans as the St. Albans Rubber Co., an agreement having been adopted with Viscount Grimston, who was the moving spirit of the rubber company. The first directors are the Viscount and his father, the Earl of Verulam, who already holds directorships in numerous companies. New machinery has been installed at the works, and I understand that the intention is to embark upon the mechanical trade generally. One of the new mixing rolls is stated to be the largest in use in Great Britain.

RUBBER SUBSTITUTE TRADE IN SPAIN.

Most of the rubber substitutes employed in Spain are floating qualities and are principally used in the manufacture of bottle rings, bicycle tires and the like. Sulphurized oil is the base of all of these substitutes. The usual black sort is used in manufacturing pneumatic tires and tubes; the white quality in all sorts of technical rubber goods.

The floating qualities were formerly furnished by German firms, in 2,000 to 20,000 pound lots, at prices varying from \$9.50 to \$10.12 per hundredweight. The ordinary brown qualities were furnished by these firms at prices varying from \$6.19 to \$7.74 per hundred pounds, and the white qualities were sold at from \$8.09 to \$9.23 per hundredweight.

At the present time Spanish manufacturers are experiencing considerable trouble in obtaining rubber substitute. Many who made their purchases in Germany and France are obliged to get what they can from England, as both German and French manufacturers have ceased exporting rubber substitutes; and exports of these substitutes from England are only allowed under condition that the Spanish manufacturer intends to use them for his own needs and will neither export the raw material nor the finished article manufactured therefrom.

Most of the Spanish rubber factories are in Barcelona, and vicinity; there is only one factory in Madrid. This is the firm of L. Paris y R. Catin, 64 Calle Zurbano, which is now working night and day to supply the needs of that city, which is quite a large market for rubber goods. An important Barcelona firm is G. Klein, 61 Calle Princesa.

A FRENCH EXPLANATION OF THE GERMAN RUBBER SUPPLY.

Under the heading "The Key to a Mystery," a French contemporary says: "The Germans have been cut off from crude rubber supplies for over six months and their stock of this material was small in August, 1914, yet they continue to use rubber tires freely. The secret of this is said to be in their application of a process for reclaiming rubber invented by a Frenchman, E. Ronxeville, whose discovery never received the serious attention of French rubber interests."

GERMAN RUBBER EXPORTS TO THE ORIENT.

Before the war broke out Germany did a considerable business in rubber goods with the Balkan States and the Orient. According to German reports, this trade was continued on an extensive scale until the German government placed an embargo on exports of rubber manufactures, only coming to a dead stop with the attack on the Dardanelles by the allied fleets. Most of the sales were made from goods in stock when the war broke out, and these were disposed of at very good prices. The fact that these German rubber manufactures could be sold at premium prices in spite of the difficulties of trade gives German rubber manufacturers great encouragement for the future of their export trade.

Their only serious competitor appears to have been an Italian firm which was offering goods at normal prices until the German manufacturers experienced difficulties in making deliveries, when the Italian firm increased its prices from 10 to 15 per cent. Outside of considerable quantities of rubber sold in Bucharest and Sofia, there was practically no competition on the part of Russia, and there was little or no French or British competition. Necessarily many shipments were made in foreign neutral bottoms, and this increased the freight charges from 4 to 6 per cent. German sellers assumed these extra expenses, while war insurance was, as a rule, charged to the purchaser. The usual course of settlement was to have the purchaser pay by check to the seller's agent, allowing a suitable discount for cash. Shipments with bill of lading attached were also made in a considerable number of cases.

Fluctuations of exchange are always a difficulty in Oriental trading, but a particular complication for German exporters was the disposition of Orientals to do all their business in French gold. Orders on Paris would not have been paid to German or Austrian holders, and only a limited number could be obtained on Swiss and Italian banks. But by some sort of mutual agreement between the German sellers and their Eastern customers, the drafts came to Berlin and Vienna for settlement. Very few Oriental purchasers took advantage of moratoriums, and no difficulties were experienced in collections. When the allied fleets attacked the Dardanelles and put an end to sea shipments, practically all the Oriental trade of German rubber manufacturers came to an end. Shipments by rail are few and far between, for the difficulties and delays are too great for this traffic to be practicable.

RUBBER IN THE EUROPEAN WAR.

The great conflict now raging is distinguished from all former wars not only by reason of the vast area it covers and the unprecedented number of men involved, but in many minor ways as well. For instance, in no former war has rubber played any considerable part, but in this war it is a factor of commanding importance. The huge armies now facing one another rely on rubber for their own transportation as well as for the transportation of their food, ammunition and other supplies. Their immense automobile transport system could not exist were it not for rubber tires. Despatch riders rely on automobiles, motorcycles and bicycles. The commanding officers no longer travel on horseback, but in motor cars; and the wounded are carried to the rear in auto ambulances made easy by pneumatic tires. Rubber plays an all-important part in the balloons and aeroplanes that are the eyes of modern armies, and it is used in insulating the thousands of miles of wires of the intricate telephone systems which link together every detachment of the vast armies.

The extensive trench fighting which characterizes this war would have claimed the lives of many more men had it not been for the possibilities of rubber. Rubber boots and socks, rubber trench capes and coats, rubber ground sheets and rubberized tents have made it possible for men to exist with comparative health and comfort under most unwholesome conditions. The European soldiers are using folding rubber water buckets and rubber horse-troughs. These are but a few of the hundreds of uses to which rubber has been put in this war.

RUSSIA'S IMPORT DUTY ON RUBBER GOODS.

According to the tariff schedule of March 13, 1915, the following rates of duty are imposed on imports into Russia: On crude rubber and gutta percha, also rubber waste unfit for use as manufacture, 1 ruble 80 kopeks per pood (2.57 cents per pound); on rubber-covered wire containing wire not less than 1 millimeter in thickness, 6 rubles 16 kopeks per pood (8.78 cents per pound); containing wire of less than 1 millimeter in thickness, 7 rubles 70 kopeks per pood (10.98 cents per pound); wire tissues in the form of a bunch or cable, covered with gutta percha, etc., with diameter of the separate wires 0.2 of a millimeter or more, 17 rubles 80 kopeks per pood (24.26 cents per pound), less than 0.2 of a millimeter, 19 rubles 47 kopeks per pood (27.77 cents per pound). On silk covered wires 50 per cent. is added to the above duty. On electric cables of all kinds the rate is 7 rubles 37 kopeks per pood (10.48 cents per pound).

A conference was recently held in Petrograd to determine the amount of foreign credit that will be required by Russia in the near future for her industrial undertakings and certain trading houses. Estimates then made—based on imports for the year 1913 and for the first six months of 1914—of the value of the goods of paramount importance that would be required, included rubber to the value of 40,000,000 rubles, or \$20,600,000.

The Rubber Trade in Germany.

By Our Regular Correspondent

THE occupation of conducting a trade publication in a country engaged in war and shut off from most of its supplies of materials, is not altogether an easy one. The habit acquired through long years of giving news as it is compels a presentation of facts as they actually exist, and at the same time the desire to present the situation in as encouraging a light as possible makes it an editorial duty to be cheerful and optimistic. These two opposing forces are liable to result in contradictions.

For instance, in a leading rubber journal here we read in one number that the rubber sporting goods industry has been almost obliterated by the war, that no new goods are offered and that the old goods some of them quite shoddy are priced at such a high figure that purchasers are few. In the next number we find the statement that large quantities of footballs, tennis balls, hockey balls and other sporting goods are being used by the German troops in order to keep the soldiers in good physical condition.

On one page we read that substitutes for rubber are being successfully used in the manufacture of a great many articles, so that the shortage in the supply of crude rubber is not being seriously felt. On another page we are told that the dealers are exceedingly apprehensive as to the effect on the consuming public of the goods now being made from rubber substitutes. They fear that the shortcomings of these articles of substitute origin will be charged by the general consumer against the whole rubber industry and that if in the future these same articles are again made of genuine rubber they will have to overcome a very general prejudice.

PRICE OF BENZOL AND NAPHTHA SOLVENTS.

When Germany was cut off from all sources of supply of crude oil, speculators attempted to get control of this market, and raised prices to such a figure that the German manufacturers were caused a good deal of anxiety. An order of the Imperial Government has established maximum prices for solvents as follows:

	Per 100 Kilograms.	Per Pound.
Pure toluol	45 marks	\$0.0486
Naphtha solvent I	43 marks	0.0465
Naphtha solvent II	33 marks	0.0357
Xylol	43 marks	0.0463

These prices are f. o. b. factory, and do not include shipping costs. There will be no interference with existing contracts, either private or governmental, as long as the prices in these contracts do not exceed the maximum prices fixed by the Imperial order.

THE RUBBER HOSE BUSINESS.

The maximum figure in the sales of rubber hose is generally reached in this country during the month of May. This year the figure was very low as compared with previous seasons. Winter continued late, April was an exceptionally damp month, and finally, interest in the fate of the country has distracted attention from the lawns; so very little garden hose was sold. There were absolutely no exports in this line.

GERMANY FOR THE GERMANS

"Deutsche Arbeit" (German Handicraft) is the name of a new German association, the object of which is to encourage German commerce and industry and fight everything of foreign origin. This association announces that Germans should use nothing but German goods, made from German materials by German workmen.

SILENCE IN GERMANY.

An article entitled "Secrecy," which recently appeared in a trade paper here, reminds commercial travelers in all lines, including rubber goods, that in many of the small places they visit they take the place of newspapers, and that, like newspapers, they should be silent on subjects of vital importance to the safety of the "fatherland." Severe prison sentences have been imposed in several cases on talkative traveling salesmen who have carried too much news from one place to another. The publication referred to believes that under present conditions commercial travelers in Germany should confine their conversation strictly to business, and only make such mention of war and war conditions as may be absolutely necessary.

LEATHER

Leather has become so scarce and its price so high that German manufacturers using this material in connection with their rubber goods, and otherwise, have been obliged to turn their activities to other lines. Leather straps and belts can no longer be produced for other than military purposes, and substitutes have to be resorted to.

ARTIFICIAL RUBBER AND HEALTH.

German school children having come to use erasers made exclusively of rubber substitutes, the authorities ordered an inquiry as to what effect these erasers might have on the children's health. These substitute erasers contain vegetable oils, glass and mineral powders, and it was thought that through inhaling the dust of the erasers, or possibly through swallowing small pieces, the children's health might suffer. As a result of the inquiry it is stated that rubber substitute erasers are no more injurious to health than real rubber erasers, which also contain many of the same ingredients.

ENCOURAGING THE GROWING OF HEMP.

Hemp is used considerably in the manufacture of hose and other rubber goods, and it therefore is of interest to learn how war is affecting the supply of this important textile. Germany has produced but small quantities of hemp and before the war received most of her supply from Russia and Italy. Russian exports to this country naturally ceased with the outbreak of hostilities and Italy soon placed an embargo on her exports of hemp. Germany was thus thrown entirely on her own resources and she has been doing all in her power to encourage her farmers to develop this line of agriculture. A "Hemp Committee" was formed by the German Hemp Manufacturers' Syndicate, and it has been decided to guarantee a good market to hemp producers. The "Hemp Committee" states that at least 90 per cent. of the German hemp for the coming season will net the producer from 600 to 800 marks to the hectare or from \$58 to \$77 to the acre. The Hemp Association furnishes seed free of charge.

EMBARGO.

German rubber manufacturers are complaining, as much as they dare, of the manner in which the Government is enforcing its embargo on exports of rubber goods. A recent ruling makes it a crime to export even the small hand rollers used for glazing photographs, although these contain only a few ounces of rubber.

The Semperit Austrian-American Rubber Works, Vienna, Austria, are reported to have contributed one million crowns (\$203,000) to the latest Austrian war loan.

During 1913 the imports into Bulgaria of crude rubber and gutta percha and rubber manufactures amounted in value to \$159,418, as compared with a value of \$286,991 for the same class of imports in 1912.

Rubber Production in the Malayan Peninsula.

By Our Regular Correspondent.

IN its annual report for the twelve months ending March 31, the Planters' Association of Malaya records "a marked tendency for the premium on 'fine hard' over 'plantation' to disappear, until the embargo on rubber exports from Great Britain gave Para an advantage in American markets."

The output of rubber from the whole Malayan Peninsula amounted to 47,006 tons, which compares with previous years as follows:

1906	tons	430	1911	tons	10,782
1907		885	1912		20,327
1908		1,629	1913		33,641
1909		3,340	1914		47,006
1910		6,504			

The probable production of the Peninsula for 1915 is put at 61,800 tons. The figures relating to exports are equally interesting, showing, as they do, a considerable increase in the direct export of rubber from the Straits to America:

To—	1913.	1914.
United Kingdom	tons 29,994	37,733
Continent of Europe	1,654	2,032
Ceylon	818	1,235
America	2,703	5,815
Other countries	522	642
Total	35,691	47,475

In this connection the report states that the Singapore market steadily grows, 3,685 tons being disposed of at the 1914 auctions, against 1,695 tons in 1913, and 599 tons in 1912. Making allowance for the terms of business, prices have compared very fairly with London prices. Regular public auctions have likewise been held at Penang, Malacca and inland towns.

AREAS PLANTED IN MALAYA.

At the end of 1906 there were approximately 100,000 acres planted with rubber in the Peninsula. Owing to the incompleteness of returns from the various territories, it is not possible to quote accurate statistics, but according to the most probable estimate it is believed that the following list of annual plantings will give an approximately correct view of the present extent of the industry in British Malaya:

Previously planted	acres	100,000
1907		76,000
1908		58,000
1909		56,000
1910		71,000
1911		118,000
1912		83,000
1913		66,000
1914		42,000
Total		670,000

At present, further extensions are on a much more modest scale, but they have by no means come to an end, capital raised for this purpose being in some cases not yet fully expended, while in others the application of profits to this end is relied on to compensate for initial over-capitalization.

ROUGH AND READY VALUATION.

While more scientific methods of valuing rubber have not, says the report, so far been adopted by the buyers, some nearer approach has been made to a rough and ready standard, judged by feel and appearance. "Standard crêpe" and "Standard smoked sheet" are now well understood terms, and in methods of manufacture to meet the demand for these grades there has been steady improvement. Factory administration has likewise advanced in increased cleanliness of preparation and waste-saving methods. Various new methods of curing have been introduced and have met with more or less favor, but the great majority of estates adhere to one or other of the above-named forms for turning out their crop. In the market there has on the whole been a preference shown for smoked sheet during the past year.

Referring to the prospective demand for the product, it is remarked that in the face of the cessation of a large proportion of the demand for articles of luxury in rubber, the satisfactory level of prices is plainly ascribable to its importance—imperfectly appreciated in advance—as a munition of war. Apart, however, from the uses of motor traction in campaigning, the war consumption of horse flesh has doubtless greatly stimulated the employment of the mechanical vehicle for civilian purposes. This latter should prove to be a permanent effect.

RUBBER AND THE WAR.

Presiding at the annual meeting of the Java Amalgamated Rubber Estates, Herbert Wright gave some interesting statistics dealing with the present and future prospects of raw rubber. He stated that as against a total crop of plantation rubber last year of about 65,000 tons, this year there would be approximately 80,000 tons. Tapping would take place on all the areas planted in rubber prior to and during 1909. The total area in this category is 600,000 acres, calculated to produce this season 75,000 tons. A further 5,000 tons might be added on account of areas planted early in 1910. America, he said, would take this year a tonnage of raw rubber equivalent to the whole of the plantation output (80,000 tons). America had always been the biggest importer and for years in succession had taken more plantation and less wild rubber. American activity in raw rubber was the real index of the market, and the increased import by that country this year was in accordance with anticipations. For the last three years the rubber imported by the United States was, in round figures, 40,000, 50,000 and 60,000 tons; so that the figures of 80,000 tons for this year was only slightly above the normal annual increase. This year we had already exported, during four months only, nearly 15,000 tons to the United States, and it was common knowledge that Eastern centers had added to this total. At this rate America would take, during the present year, 10,000 more tons of plantation rubber than she did last year. Estimating 80,000 tons for America, the balance in tonnage of the world's production, about 45,000 tons, could be apportioned according to fancy among European and Far Eastern countries. Even this country could take almost half the balance. Assuming that the war continued, there would not be sufficient rubber to go round, and steady, if not advancing, prices could be assured. Even without war this would have been a year when production would not have kept pace with the normal increase in consumption.

AFTER THE WAR.

Assuming for the sake of argument that the war would be over in 1916, Mr. Wright asked, "What would be the position afterwards?" Up to 1910 there was planted in the Middle East approximately 750,000 acres, and this should yield about 100,000 tons in 1916. In 1911 a further 200,000 acres were planted, from which 10,000 to 20,000 tons might be obtained in 1916. His total estimate of plantation rubber for 1916 was, therefore, from 110,000 to 120,000 tons. This production was based upon the assumption that price and labor remained satisfactory; if prices or labor conditions were unfavorable, the estimate would not be reached. Plantation rubber was the only variety that could show an increase this or next year. Africa and Brazil together could certainly not exceed their average output, and wild rubber might, for their purposes, be estimated for 1916 at 45,000 tons; giving a total production of from 155,000 to 165,000 tons for the year.

Prior to the war the importance of the various countries was, in terms of consumption,—first America, then the United Kingdom, followed by Germany, Russia, France, Austro-Hungary, Italy and Japan. Though America consumed as much as all

the others put together, the other seven accounted for a consumption of something like 60,000 tons per annum. Furthermore, all the seven countries were participants in the war, and had sustained, or would sustain, increased consumption largely at the expense of accumulated stocks. The Allies could not claim to have a larger amount of manufactured rubber articles today than they had before the war. Germany and Austro-Hungary could certainly not claim to have any stocks beyond those represented by the perhaps considerable amount of contraband they had successfully manipulated. They had, therefore, to allow for urgent requirements on behalf of enemy countries after the war, not merely for daily consumption but for making good the stocks usually held by manufacturers. He believed that, subject to credits being good, Germany and Austro-Hungary would require in the first year after the war not less than 40,000 tons of rubber. The estimated increased requirements of the enemy countries, though slight, would take a fair slice of the increased plantation production anticipated for 1916. He would, therefore, not be at all surprised to find that the enemy countries, together with America, would consume a total tonnage equal to the whole of that which was estimated from plantations for 1916, namely, 110,000 to 120,000 tons. That only left about 45,000 tons for the United Kingdom, France, Russia, Italy and Japan, which was much below their total average consumption. The point he wished to make was simply that the increase in production during 1916 was offset by the depletion of manufactured articles in enemy countries and the impetus which the war would give to the use of rubber in countless directions.

MEETING OF THE PLANTERS' ASSOCIATION OF MALAYA.

Commenting upon the recent meeting of the Planters' Association of Malaya, the "Malay Mail" congratulates the planters on their choice of Mr. W. Duncan as chairman of the association, succeeding the Honorable E. Macfayden. It expresses the hope that, with a planter from Northern Malaya as chairman, the attendance of planters from that part of the colony will in the future be greater at the association meetings. During 1915-1916 an enormous area will come under tapping, and planters fear a labor shortage. The war stopped immigration into Malaya. Indian immigration has begun again, but is still below the normal. Restrictions on Chinese immigration are still in force.

PERAK PLANTERS BELIEVE THE DEPARTMENT OF AGRICULTURE SHOULD DEVOTE MORE ATTENTION TO RUBBER.

In a late issue of the "Malay Mail" reference is made to a resolution recently passed by the Central Perak Planters' Association expressing their disapproval of the work of the Agricultural Department. The association is not satisfied with the control of pests and diseases as carried out by the department and asks the assistance of district associations in supporting a request that the parent association at Kuala Lumpur bring the necessity for better attention and general efficiency to the notice of the Government. The item concludes with the following paragraph:

"The resolution leaves no room for doubt. I am afraid that it is an opinion pretty generally shared by planters throughout the country. There is a general feeling that the department is not doing all that it might to develop the rubber industry."

SPOTS ON RUBBER.

A bulletin of the Department of Agriculture of the Federated Malay States discusses the conditions which favor the formation of spots and the discoloration of rubber, also the methods of prevention. Spotting and discoloration are generally due to common saprophytic fungi (*Penicillium sp.* *Fusarium sp.*, etc.) which contain proteolytic enzymes. Infection takes place while the latex

is being collected. Only under abnormal conditions does the rubber become infected after preparation and while in the drying sheds. The best method of prevention is by treating the latex with formalin, by quick drying of the rubber, by thinner working and addition of "sodium bisulphite." Dilution of the latex with water increases the danger of infection and the tendency toward spotting; and so also will excess of coagulant.

FEDERATED MALAY STATES RUBBER EXPORTS.

An official cablegram from Kuala Lumpur announces that the export of plantation rubber from the Federated Malay States, during the month of May, amounted to 2,708 tons, as compared with 2,777 tons in April and 2,069 tons in the corresponding month last year.

The following table shows the export for the first five months of the last three years:

	1913.	1914.	1915.
January	2,131	2,542	3,473
February	1,757	2,364	3,411
March	1,737	2,418	3,418
April	1,626	2,151	2,777
May	1,225	2,069	2,708
Total	8,476	11,544	15,787

THE THINNING OUT OF RUBBER PLANTATIONS.

The question of thinning out rubber plantations has been much discussed. Opinions on the subject vary considerably. Most planters are of the opinion that 100 trees to the acre is quite the limit for good results, but that it certainly would be a mistake to reduce existing plantations strictly to this number, for allowance must be made for a certain death rate even among healthy trees. One expert explains that the *Hevea Brasiliensis* is practically a swamp tree originating in the lowlands which each year are overflowed by the Amazon river. There it obtains the quantity of water necessary for its full development. With this idea in view he believes all plantations too thickly planted to allow the *Hevea* to reach its normal development.

RUBBER LATEX PREPARED WITH URANIUM BORATE.

The use of uranium borate in the preparation of rubber latex has been recommended to Ceylon planters. It is stated that 8 ounces of this borate to every 100 pounds of latex—equivalent to 8 ounces to each 50 pounds of rubber—when thoroughly mixed with the latex before coagulating considerably improves the appearance of the rubber, prevents oxidation on shipboard and in storage, and at the same time increases the tensile strength of the product.

Of course this addition of uranium borate increases the cost of production of crude rubber, but on the other hand it is claimed that the treatment also increases the value of plantation rubber by from £40 to £50 per ton.

CYCLONE SWEEPS KLANG RUBBER ESTATES.

The damage done the rubber plantations by the storm that swept the Klang district of the Malay Peninsula in April is estimated at £250,000. The tornado struck the rubber plantations at a time of the year when they are most susceptible to injury. The rubber trees had finished their wintering and were in full bloom, bearing heavy foliage, and were naturally unusually tender. The storm followed a well defined course, but at points varied in intensity. In one section of about 20 acres not a tree was left standing. A rough estimate places the number of trees destroyed at 47,000.

A hurricane recently swept over the Lunas Rubber Estates (Selangor), breaking and uprooting 1,450 mature rubber trees. Some of these trees may possibly be saved, but they will not be fit for tapping for a long time. Young trees with their light foliage did not suffer from the wind. Slight damage was also done to the buildings on the estate.

TWO AMERICAN PLANTING COMPANIES

The eighth annual reports of the Pahang Rubber Co., Limited, and the Tanjong Olok Rubber Co., Limited, of Malaya, have recently been issued, covering the year 1914. The list of officers and directors in these two companies includes the names of Mr. and Mrs. Fred F. P. Waterhouse, of The Waterhouse Co., Limited, Honolulu, Albert Waterhouse being secretary and Fred F. P. Waterhouse treasurer of both companies. On the Pahang plantation, which is located at Cheroh, Pahang, the average number of trees tapped daily throughout the year was 53,781, the total tappings being 19,630,139. The production of dry rubber for the year amounted to 202,326 pounds—an increase of 77,966 pounds over the output of 1913—the average yield per tree being placed at 3.76 pounds, as against 2.73 in 1913. Total expenditures on the 1914 crop amounted to \$42,266 (\$7,602.74 of this amount being for permanent improvements), as against \$28,177.65 in 1913. The cost of tapping was 14.46 cents per pound, while the total operating expenditures on the estate, including this item, amounted to 40.98 cents per pound. The average price obtained for rubber was 44.77 cents per pound. The net profits for the year are placed at \$2,257.88 and the gross sales at \$94,875.67. The manager's estimate of production for 1915 is for 285,000 pounds of rubber.

Labor is the chief difficulty on this estate, it being practically impossible to keep a permanent force. Government work on railroads having been suspended for the present, to a certain extent, a larger number of hands are procurable than usual, and the price of labor has fallen off somewhat. The average daily wage of coolies on this estate during the year was 45.96 cents. The average number of coolies employed per day was 163, and the average collection of rubber per day for each coolie was 3.40 pounds.

The Tanjong Olok estate covers an area of 2,532 acres, of which 980 acres is planted, 70,823 trees of the 134,338 total being of tapping age. The output for the year was 202,943 pounds, on which the all-in costs totaled 29.4 cents per pound. The net profit for the year is given at \$17,378.31, the gross sales at 199,521 pounds, valued at \$93,066.75; the average price for all grades being 46.645 cents, gold, at Singapore. An average of 57,015 tappings were made daily on this estate, or a total of 20,810,467 during the year, at a cost of about 32½ cents per tree per year; and the average amount of rubber obtained per tree at each tapping was approximately .156 ounces, or 3.56 pounds, for the year. The estimated output for 1915 is 270,000 pounds.

EFFECT OF WAR ON EASTERN RUBBER PLANTATIONS.

From all available information it is clear that Eastern rubber plantations are weathering the war storm much better than even the most optimistic expected. Save for the high freights and the shortage of shipping facilities there is nothing for plantations to complain of. Rubber is slowly advancing and some hope exists that it will again reach the 2s. 6d. figure. There is no danger of rubber falling below remunerative prices, at least not in the near future. When the war comes to an end, no doubt immense quantities of rubber waste will be reclaimed, but there will also be a general renewal of strictly commercial manufacturing and consequently the chances are that crude rubber will still be needed in large quantities.

SINGAPORE RUBBER AUCTIONS.

Auction sales of rubber are held in Singapore under the auspices of the Rubber Association of the local Chamber of Commerce. This association lists practically any lot of rubber, even lots of less than a picul or 133 pounds. This results in considerable delay at auctions and a movement is now under way to expedite the conduct of sales by fixing a minimum weight for the cataloguing of lots. It is proposed that no lots of less than 3 piculs

(400 pounds) shall be catalogued. A leading broker on the Singapore market believes that better prices can be obtained on large parcels than on small ones, and he advises his customers to hold their scrap until they have at least 3 piculs of it. Small quantities will continue to be sold by private tender.

STRAITS SETTLEMENTS RUBBER EXPORTS.

An official cablegram received from the Colonial Secretary, Singapore, states that the export of plantation rubber during the month of April amounted to 1,978 tons, as compared with 2,477 tons in March and 1,548 tons in the corresponding month last year.

The following is a comparative table showing the export for three years:

	1913.	1914.	1915.
January	784	1,181	2,576
February	743	1,703	2,741
March	898	1,285	2,477
April	762	1,548	1,978
Total	3,187	5,717	9,772

These figures include transshipments of rubber from various places in the neighborhood of the Straits Settlements, such as Borneo, Java, Sumatra and the non-Federated Malay States, as well as rubber actually exported from the Colony, but do not include rubber exports from the Federated Malay States.

INTERESTING EXPERIMENTS.

Some time ago the Department of Agriculture in Ceylon prepared a small quantity of Para rubber by the Wickham process and forwarded it to the Imperial Institute, London, for experiments. Samples of crêpe rubber from trees of the same age on the same plantation were also sent to London for comparison. The Imperial Institute furnished samples of both rubbers to a number of British manufacturers who were glad to make technical tests in order to determine the quality of the rubber for industrial purposes. The reports of these manufacturers are quite interesting. One manufacturer reported that the crêpe rubber was about 8 per cent. better than the smoked from his point of view as a manufacturer and that the smoked sample contained 5.07 per cent. of resin. He declined to make any statement comparing the samples with fine hard Para.

Another firm found that the samples of smoked rubber furnished contained 3.77 per cent. of resin. The experimental department of this firm also noted that in mixings where an accelerator was present the Wickham rubber had decidedly clearer cutting properties than hard fine Para. On the other hand, when no accelerator was added to the mixing the reverse was the result, and the sample appeared in this respect to be of about the same value as ordinary smoked sheet. More efficient vulcanization was obtained with the Wickham rubber than with the sample of crêpe. The former was superior in strength to the crêpe, but still below fine hard Para, the variation being about 10 per cent. in each case. No advantage over smoked sheet plantation was discovered in the samples tested. Extensibility or strain tests showed the experimental samples much weaker than fine hard Para, and also even below the average for ordinary plantation, smoked and unsmoked. The firm that made these experiments believes the Wickham method of smoking, in which the whole of the rubber is penetrated by the smoke, to be preferable to the ordinary method of preparing smoked sheet in which the smoke is only superficial. Still another firm that experimented with the Imperial Institute samples found that the crude rubber was about 8 per cent. better than smoked block for industrial purposes.

In view of the great variance in these reports and of the impossibility of explaining them, the Imperial Institute is carrying out a series of vulcanizing and testing experiments with the remainder of the rubber.

EFFECT OF TAPPING ON THE STORAGE OF PLANT FOOD IN *HEVEA BRASILIENSIS*.

A very interesting pamphlet on the above subject, written by L. E. Campbell, rubber research chemist, was recently published by the Ceylon Department of Agriculture. After describing the structure of the *Hevea*, Mr. Campbell explains that starch is the principal storage form of plant food and that by observing to what extent the starch has been removed and reconstituted, it is possible to determine the extent to which the strength of the tree has been drawn upon in tapping it. Most of the food stuff, which consists in sugar and starch, is formed in the leaves of the plant. Sugar is soluble in water and it is in this form that food is carried by nature to the parts of the tree that need it. When the tree is tapped the bark needs food to rebuild the severed tissues. When the supply of food is greater than is necessary for renewing the bark, it is converted by nature into a form of starch which is insoluble in water and stored in this form until required, when it is again converted into sugar and conveyed from the storage cells to the part of the tree where it is needed. Therefore an adequate supply of food is necessary for health and good bark renewal.

With this theory in mind Mr. Campbell carried out a number of experiments by examining tapped trees for the presence of foodstuff to obtain indications as to the most suitable tapping systems for the maintenance of this starch reserve. Two trees, planted in 1906 and tapped first in July, 1913, were taken for experiment. They were tapped during six months on the full herring-bone system, tapping taking place every third day and one side only being tapped. It was determined that the food supply of the bark did not, during the experiments, disappear from below the tapped area, but only from an area extending about a half inch in width below the cuts and about one-third inch in width to the side of the cuts, the process of bark renewal causing the removal of starch food immediately behind the cut. Other experiments made by Mr. Campbell on different *Hevea* trees throughout Ceylon led him to conclude that the effect of careful tapping is localized around the cuts and that food for bark renewal is rarely drawn from below the tapped area. And from this he concludes that intervals between tapping are of great benefit to the reconstitution of the bark and that the resting period of each area tapped on the change-over system, i. e., the full herring-bone with five cuts one foot apart over one-half the tree—the tapping being changed over from one side of the tree to the other every six or eight weeks—is nearly as effective as if the whole tree were allowed to rest. This change-over system appears to be effective both in renewing the bark and in increasing the rubber yield of the tree.

FUNTUMIA ELASTICA IN BELGIAN CONGO.

Funtumia elastica grows wild in the forest of the Bangala district, Belgian Congo. Plantations were started in 1904 at Musa and Kutu. Those in the latter place did not give satisfactory results and have since been abandoned. Experiments have been made with 620 trees from eight to nine years old at Musa. Tapped on alternate days over a period of ten to eleven days, twice each year, these trees yielded about 6 ounces of dry rubber per annum, equivalent to 164 pounds of dry rubber per acre, per year. The cost of production was high, amounting to about 14 cents per pound, owing to unskilled tapping. With plantation *Hevea* rubber at 58 cents per pound, the *Funtumia* product was valued at 54 cents.

A correspondent on one of the daily papers published in the East advances the opinion, based on considerable observation on his part, that rubber tappers who work by the day bring in less No. 1 rubber and a larger quantity of scrap than is the case with contract tappers, who naturally are more anxious to bring in the best quality of rubber and are less concerned with the lower grades; consequently the contract tappers are more alert and more successful, in his opinion, in gathering first quality rubber.

RUBBER EXPORTS FROM THE DUTCH EAST INDIES.

The following comparison of the exports from Sumatra and Java for January, 1915, and January, 1914, shows that there has been a substantial increase in the volume of exports. But the most interesting feature of this tabulation is the fact that, while in January 1914, no rubber was shipped direct from Sumatra to the United States, and but very little from Java, the direct shipments in January of the present year from both of these islands to this country amounted in the aggregate to nearly 430,000 pounds.

EXPORTS FROM SUMATRA.

To—	January, 1914.	January, 1915.	Decrease, 1914-1915.
Holland	86,477	108,714	+ 22,237
England	8,123	77,149	+ 69,026
United States	—	137,784	+ 137,784
Singapore	8,940	7,917	- 1,023
Portugal	48,287	29,260	- 19,027
Total	941,427	1,255,927	+ 314,500

EXPORTS FROM JAVA.

To—	January, 1914.	January, 1915.	Decrease, 1914-1915.
Holland	28,539	105,576	+ 77,037
England	5,149	445,111	+ 440,000
Germany	1,498	—	- 1,498
Belgium	43,690	—	- 43,690
Other Europe	6,185	—	- 6,185
United States	20,064	188,795	+ 168,731
Singapore	19,030	25,623	+ 6,593
Other countries	—	19,554	+ 19,554
Total	594,555	784,659	+ 190,104

RUBBER EXPORTS FROM JAVA AND MADURA.

During March exports of rubber from Java and Madura amounted to 286,270 pounds, against 337,891 pounds exported during the same month last year; showing a decrease of 51,621 pounds. During the first three months of 1915, 1,007,015 pounds of crude rubber were exported, as compared with 883,403 pounds exported during the same period in 1914; showing an increase of 123,612 pounds.

A CENTRAL RUBBER TESTING STATION FOR THE DUTCH EAST INDIES.

The creation of a central rubber testing station for the Dutch East Indies, which was practically decided upon at the Rubber Exposition at Batavia, is the realization of a scheme that has long been recognized as a necessity.

This station will be installed in Batavia with branches throughout the colony, and its principal object will be to investigate improved methods of preparing and curing rubber, to create standards for the classification of qualities of crude rubber by exercising a regular control over the monthly shipments, and to issue certificates bearing on the quality of the rubber.

MEETING OF RUBBER MEN AT THE HAGUE.

At the general meeting of the International Association for Rubber Cultivation in the Netherlands Indies, held at The Hague on May 20, the council presented their report for the year 1914 and the program of work for 1915. The chairman, A. G. N. Swart, and the retiring members of the council—J. E. de Beaufort, Dr. A. H. Berkhout, Jacques Bernard, Noël Bing, J. P. C. Bruyn and Ed. Bunge—were re-elected, and A. Ed. Dinger, director of the "Internationale Crediet- en Handelsvereniging Rotterdam"; F. de Fremery, director of the "Deli-Batavia Rubber Maatschappij," and O. F. Weise, partner in the firm of Weise & Co., were elected to the vacancies in the council caused by the deaths of W. Geuken, F. Koch and Jac. Musly.

RUBBER TRADE IN SHANGHAI.

During 1913, 3,822 pairs of rubber shoes for Europeans were imported at Shanghai, as compared with 2,124 pairs imported for same trade in 1912. Only 1,402 pairs of rubber shoes made specially for the Chinese were imported in 1913, as compared with 26,868 pairs imported in 1912; showing a decrease of 25,466 pairs.

PRESENT CONDITIONS OF THE RUBBER MARKET AT MANAOS.

By a Special Correspondent.

FOR years the world has been hearing but one kind of sound from the Amazon—that of complaint and distress. We are told increasingly that the Amazon is a lost case since her principal produce—fine Para—lost the control of the world's rubber market, owing to the phenomenal growth of plantation production and the consequent reduction in price of the commodity.

The few voices which timidly asserted confidence in the latent power of the country to adapt itself to new conditions and to come out of the struggle victorious in the end, did not succeed in making themselves heard. Nor is it surprising that this should have been so, since those concerned with plantations in the East had an interest in demoralizing the Amazon as much as they could, in order to draw public attention away from the primitive home of the *Hevea* in the direction of their own enterprise, never losing an occasion to preach the downfall of the great rubber center. Not only this, but the majority of the leading men on the Amazon, in their efforts to get help and concessions from the Federal Government, joined the general chorus of distress, helping to make the whole world believe that the end of the rubber industry had come.

There can be no doubt that the sudden and violent fall in prices wrought havoc on the Amazon; fortunes were lost—the fruit of a lifetime of hard work and never-ceasing enterprise in combating and overcoming the enormous difficulties which nature and climate prepared for the daring *seringueiro*. Values were annihilated, property became almost worthless, credit ceased entirely, and public finances—based almost exclusively upon the production of rubber—reached a condition bordering on bankruptcy.

But they who counted upon the definite annihilation of the Amazon rubber industry ignored—whether purposely or not—the strength and elasticity of the country. To the attentive observer signs of nascent restoration on the Amazon, from the economic-financial point of view, are beyond doubt; to those well versed in Amazonian affairs they come as no surprise.

As a matter of fact, for many years there has been too large a margin of profits in the rubber-gathering industry, entailing as a natural consequence the reduction of productive work to a minimum and raising unproductive expenditure to a maximum. Economy was at one time a word unknown on the Amazon—the fury of spending was the order of the day, both for the individual and for public administrations.

There have been several crises upon the Amazon in former years, all forgotten as quickly as they came, because invariably the direct cause of such crises disappeared within a short period.

When the present debacle set in, people were not inclined to take it too tragically, relying on the good star of the country to point the way out, as had been the case so often before. Consequently, careless life and expenditure, uneconomical working, and the never-ceasing discounting of the future went on for a time, aggravating the situation rapidly, until a point was reached when the Amazonians awoke to the fact that they were on the wrong track.

From that moment two different movements could be distinguished. One was directed by the official element, and many of those who found themselves on the verge of ruin through the great shrinkage of values in all property assets in the interior, called out for help from the Federal Government; the *Defeca da Borracha* was created but proved a complete failure. It is not the object of these lines to discuss the reasons which caused this effort of the Federal Government to be a fiasco; it is certain, however, that with the amount of money that was then sacrificed something profitable could have been done had better judgment of the needs of the Amazon prevailed.

All the same, one distinct advantage resulted—a considerable augmentation of the subvention paid to the Amazon River Com-

pany in exchange for cheaper freight rates all over the Amazon and its affluents, together with better and more regular shipping facilities on the upper rivers.

Apart from this, the effort of the Federal Government was pure waste, and the latter, with this result before their eyes, will not be likely to embark on another such venture. Nevertheless, the Amazonian people continued in their appeals for help, painting the situation as black as possible. In doing so they are right as far as the Amazonas and Para State and municipal governments are concerned, for these are crippled with debts incurred when everything looked rosy and there seemed to be no limit to the continuous increase of revenues.

Now, seeing themselves faced with a greatly curtailed income, quite insufficient to meet the current expenses and those of the heavy obligations formerly assumed, and unable to increase taxation of the population, they revert with reluctance to the cutting down of public expenditure and probably, as time goes on, they will succeed in making both ends meet.

In the meantime, however, their cries of distress give a wrong idea of the real situation on the Amazon as far as rubber production is concerned. In fact, while this part of the Amazonian population practically obtained nothing, their system working directly against Amazonian credit and resulting in the almost complete cessation of credit not only in the United States and Europe but also in the Argentine and in Brazil itself, another party got to work unostentatiously.

Accepting the actual situation of Amazonian rubber with regard to the plantation product as a consummated fact, they did not look back on departed prosperity, but sturdily took the matter in hand in a practical manner: they set out to cheapen production, and lo! what before had seemed almost impossible proved to be quite possible.

Business was placed on a more solid basis; shipping was run on more economical lines; a closer control of the *seringueiros* was inaugurated: the *acaimentos* (the out-fittings) were reduced, and the people living in the woods were induced to plant the greater part of the crops they needed for food, such as beans, mandioca, cane, etc. The rubber gatherers were held to their work for a longer season, which isn't even then a desperate effort, considering that the average *seringueiro* seldom works much over 100 days in the year, although there is no reason why he should not work for at least 200 days.

Naturally, increased rubber-gathering effort was confined to places of relatively easy access, as are all the lower parts of the upper rivers with regular shipping communication with Manaus. The results are plainly seen already.

The following data give a fair idea of the evolution the Amazon is undergoing:

Imports from Manaus to the interior decreased from 1,259,984 volumes—59,723 tons—in 1912, to 823,870 volumes—38,257 tons—in 1914. And in spite of this decrease of almost 35 per cent. in merchandise sent up the rivers, entries of rubber (*Hevea*) at Manaus for the first nine months of the present crop—July 1 to March 31 last—increased from 17,900 tons during the last crop, to 18,120 tons for the present crop.

This increase of about 220 tons of *Hevea* rubber for the nine months of the crop may appear insignificant at first sight, but if we consider that the output on the upper rivers, especially the Federal Territory, suffered a decided decline and that this was made up by a larger production on the lower parts of the rivers, the results of the efforts of Amazonian and more especially the Manaus people, become evident. In fact, the output of the rivers which do not reach the Federal Territory, viz., the Madeira, Solimões and Rio Negro, increased from 6,382 tons to 7,167 tons, or a plus of 715 tons for the nine months.

Under these conditions, Manaus commerce is far from being distressed—in fact, the present crop has not only been satisfactory in quantity but prices have also left a satisfactory margin. Lower exchange has contributed to this result, but there is no doubt that

should sterling prices drop farther, the Amazon is now in condition to face the situation and to cheapen and increase production still more. The initial steps have proved entirely successful. And "as there is a vast forestal reserve of *Hevea* at hand all over the country—only 5 to 10 per cent. of which is being explored at present—there is no reason why Amazonian production of Upriver Fine should not go on increasing, no matter what the price of plantation rubber will be."

The foregoing data refer only to *Hevea* rubber. The total exports from Manaos, including the *Castilloa* product known as caucho and caucho balls, show a deficit of about 2,400 tons for the nine months of the crop, owing to the decrease of about 2,600 tons in the output of the latter description, which is almost exclusively produced on the headwaters of the rivers, the work being chiefly done by Peruvians. In an increase of production of this quality Amazonians have but a secondary interest, the more so as this industry requires a nomadic population, which does not contribute to the settling and populating of the country as does the *Hevea* industry.

THE RUBBER CRISIS IN BOLIVIA.

THE rubber situation in Bolivia has been treated very thoroughly in this publication, but it is always interesting to note how conditions appear to new observers, especially to experienced travelers. The Scandinavian explorer, Nordenskjöld, paid a recent visit to that country, and the results of his explorations and the conclusions at which he arrived are briefly given in the following paragraphs:

Since 1880 rubber has been the principal source of wealth in northeastern Bolivia, just as it is the principal article of trade in large districts of Brazil and Peru. Bolivia's rubber forests lie on the banks of the Rio Beni, the Rio Madre de Dios, the Rio Abuna and the Rio Guaporé. All the rubber gathered in this district is taken by boat or steamer to such centers as Riberalta and Villa Bella, where it is marketed and shipped either to Europe or to North America. Rubber merchants conduct their dealings with rubber gatherers on an exchange trade basis, food, spirits, wines, firearms, phonographs and the like being given in exchange for rubber. Rubber gatherers are obliged to provide themselves with food in the market centers, for in the rubber districts they cannot find sufficient supplies. Labor has been a great problem for Bolivian rubber merchants, and to obtain it they have often resorted to slave trade methods, so few are willing to volunteer to penetrate the deep forests.

Plantation rubber has become a severe competitor of South American rubber, and the fall in rubber prices has brought this Bolivian industry practically to a standstill. Many believe that the history of Bolivian—and in fact all South American rubber—will be a repetition of that of Peruvian bark. It was in 1820 that two French explorers brought news of the qualities of this bark and started the quinine trade. Asiatic plantations now supply practically the whole of the world's demands for quinine and South American districts where bark was formerly gathered for quinine are now turned over to the monkeys and the jaguars.

Many believe that Bolivia will have to turn to agriculture and cattle raising as substitutes for its lost rubber trade. For this better means of communication will have to be established, and perhaps the Panama Canal will prove of considerable help in this connection.

These prophecies apply to a great extent to the Brazilian and Peruvian rubber industries, as well as to that of Bolivia. In other words, the South American rubber crisis is far-reaching in its effects, and, should prices continue to fall after the war, practically the whole population of the Amazon valleys will have to seek new means of existence, and this certainly will not be an easy matter. No doubt the struggle against plantation competition will be kept up to the last extremity largely at the expense of the *seringueiros*.

PLANTATIONS OF *HEVEA BRASILIENSIS*.

The area under *Hevea* in British Guiana in 1912-1913 was 2,800 acres, and during that year over 110,000 stumps were imported from Ceylon and Surinam, while 120,000 plants were raised from seeds imported from Ceylon and the Straits Settlements.

In Nyasaland, British Africa, where the Africa Lakes Corporation, Limited, has a plantation of about 100,000 *Hevea* trees from one to seven years old, the trees are reported to be about two years behind those of Ceylon in growth, but tapping experiments give very satisfactory results.

BRITISH GUIANA EXPORTS.

From January 1 to May 20 of the present year there were exported from British Guiana 730,536 pounds of balata and 825 pounds of rubber. In the same period of 1914 the balata exports amounted to 314,278 pounds, and no shipments of rubber were made. Of the 1915 balata exports, 637,299 pounds was sent to the United Kingdom and the balance, 92,257 pounds, to the United States.

EXPORTS OF RUBBER AND BALATA FROM PANAMA.

The rubber and balata industry of the Republic of Panama showed for 1914 (except for exports of balata from the City of Panama) a considerable decrease as compared with the previous year. The total exports of rubber from the isthmus republic amounted in value to \$10,770, against \$19,116 in 1913. The exports of balata amounted to \$94,822 as compared with \$108,714 for the previous year. The decrease in the value of exports of balata is attributed to the fall in the prices of this gum, which amounted to about 40 per cent. In 1913 Panama balata brought from 48 to 56 cents per pound, as compared with 30 cents per pound, the average price in 1914. During 1914 the port of Panama exported balata for the first time, these exports amounting to \$28,963. This was due to the fact that balata and its development had never before received serious attention on the Pacific coast of Panama, where its character and commercial value were little known. All the exports of both rubber and balata from the Republic of Panama were shipped to the United States.

COTTON IN ARGENTINA.

Cotton is grown in many parts of Argentina, but especially in the Chaco district. Argentine cotton has been exported chiefly to Germany and Spain. In 1913, 1,540 bales were exported, and in 1914, 1,219 bales. This, compared with 2,460 bales exported in 1912, shows that the Argentine cotton industry is retrograding.

A Spanish capitalist recently applied to the Argentine Ministry of Agriculture for 12,355 acres of land located in any part of the cotton-growing zone at a reasonable price on easy terms of payment, his purpose being to install a complete cotton mill of 12,000 spindles and 400 looms, to handle cotton from the raw product to the finished article, including bleaching and dyeing of the manufactured goods. This offer is receiving the consideration of the Argentine government.

TIRES IN ARGENTINA.

In Buenos Aires, Argentina, where automobiles are used extensively and where the asphalt streets are frequently washed and consequently are very slippery, a municipal decree compels the use of a steel-shod tire on at least one rear wheel. A great many of the automobiles seen on the streets of that city are equipped with at least two such tires, and many, especially the best, cars have all four tires of this type. The steel-shod tire is also favored in the matter of tariff duties, the duty and incidental charges on all-rubber tires being 50 cents gold per kilo. [24.94 cents per pound], while that on the steel-shod tire is 42 cents gold per kilo. [18.38 cents per pound].

Recent Patents Relating to Rubber.

UNITED STATES OF AMERICA.

ISSUED MAY 18, 1915.

- N**^o 1,140,943. Tire. R. S. Seaton, Orlino, Ont., Canada.
 1,140,944. Tire. E. O. Moses, assignor to The B. F. Goodrich Co., both of New York, N. Y.
 1,140,945. Tire. C. H. Gault, Cleveland, Ohio.
 1,140,946. Tire. R. J. Wright, Newark, and W. B. P. Allen, East Orange, both of New Jersey.
 1,140,947. Tire. M. D. Kallio, Akron, Ohio.
 1,140,948. Tire. M. Bruce, Thomasville, Ga.

Invention.

- 47,371. Tire. W. H. York, assignor to The B. F. Goodrich Co., both of New York, N. Y.

Trade Marks.

- 81,379. Mislawaka. Wachen Manufacturing Co., Mislawaka, Ind. The word *Yukon*. For rubber footwear.
 81,341. Brown Bulls Rubber Shoe Co., Brown Falls, Conn. The words *Goat Shoe*. For basketball shoes.
 82,310. The Sterling Gum Co., Inc., New York, N. Y. The words *Woods' Law* with 1915 in the center. For chewing gum.
 85,000. C. J. Bailey, Boston, Mass. Representation of a monkey, with the words *Monkey Grip*. For heels and soles for boots and shoes, wholly or in part of rubber.

ISSUED MAY 25, 1915.

- 1,140,370. Vehicle tire. J. R. Gammeter, Akron, Ohio, assignor to The B. F. Goodrich Co., New York, N. Y.
 1,140,418. Toy or joke article. A. Talke, Nieder-Goellschau, Goldberg-Haynau, Silesia, Germany.
 1,140,499. Core for use in molds and forms. J. G. Chalfant and H. G. Haun—both of Akron, Ohio.
 1,140,511. Blanket for printing press cylinders. N. J. Gauthier, Berwyn, and F. J. Gauthier, Chicago—both in Illinois.
 1,140,527. Distention device for tubular structures. P. Powell, Cambridge, assignor to Standard Tire & Rubber Co., Boston—both in Massachusetts.
 1,140,577. Heel pad mold. S. Cooke and W. C. Davis—both of Gorton, Manchester, England.
 1,140,590. Anti-skid attachment for tires. A. Gorecki, Buffalo, N. Y.
 1,140,591. Automobile tire. T. A. Hall, Cleveland, Ohio.
 1,140,602. Cement applying machine. W. F. Lautenschlager, Cincinnati, Ohio, assignor to L. Muther, Boston, Mass.
 1,140,605. Bat receptacle with elastic top. E. Spitzler, Boise, Idaho.
 1,140,635. Rubber heel. J. M. van Heusen, Jamaica Plain, Mass.
 1,140,645. Pneumatic cushion for automobiles. E. A. Wilcox, Carthage, Ill.
 1,140,718. Puncture closer for pneumatic tires. R. W. Sampson, Westmount, Que., Canada.
 1,140,720. Machine for wrapping annuli. P. E. Welton, Akron, Ohio.
 1,140,752. Vehicle tire. W. K. Leonard, Piqua, Ohio.
 1,140,777. Pneumatic tire. W. D. Trigalet, Mamaroneck, N. Y.
 1,140,778. Tire construction. W. D. Trigalet, Mamaroneck, N. Y.
 1,140,921. Method for forming gas bags or other fluid retaining envelopes for airships or other purposes. T. Sloper, Devizes, England.

Trade Marks.

- 84,003. The Republic Rubber Co., Youngstown, Ohio. The word *Invader*. For fabric and rubber belting, rubber hose and rubber machinery packing.
 84,064. The Republic Rubber Co., Youngstown, Ohio. The word *Relief*. For fabric and rubber hose.
 84,087. McTernan Rubber Manufacturing Co., Reading, Mass. The word *Kicker*. For rubber heels.
 84,080. Essex Rubber Co., Trenton, N. J. The words *Steel Heat*. For rubber and leather composite soles.
 84,088. Lambertville Rubber Co., Lambertville, N. J. The words *One* and *Two*. For rubber balls.
 84,083. Lambertville Rubber Co., Lambertville, N. J. The word *Blanket*. For rubber balls.
 84,084. Lambertville Rubber Co., Lambertville, N. J. The word *Pool*. For rubber balls.

ISSUED JUNE 1, 1915.

- 1,141,116. Tire saving suit. J. H. Huxley, Cherry Valley, Pa.
 1,141,117. Rubber ball. J. R. Bailey, assignor to the Goodrich Tire & Rubber Co., both of Akron, Ohio.
 1,141,273. Tire saving suit. P. Smith, Portland, Me.
 1,141,311. Tire saving suit. M. T. Boggs, Lawrence, Mass., assignor to Goodrich Shoe Machinery Co., Paterson, N. J.
 1,141,382. Tire saving machine. A. L. D. Lyons, Cincinnati, Ohio.
 1,141,400. Vehicle tire. J. C. Shaw, Akron, Ohio, assignor to The B. F. Goodrich Co., New York, N. Y.
 1,141,401. Tire saving suit. H. B. Gault, Grand Rapids, Mich.
 1,141,538. Pneumatic tire. H. B. Gault, Grand Rapids, Mich.
 1,141,606. Pneumatic tire. W. J. Brown, assignor to The B. F. Goodrich Co., both of Akron, Ohio.
 1,141,620. Tire. J. E. Brown, Akron, Ohio.
 1,141,621. Tire. J. E. Brown, Akron, Ohio.
 1,141,622. Tire. J. E. Brown, Akron, Ohio.
 1,141,623. Tire. J. E. Brown, Akron, Ohio.
 1,141,624. Tire. J. E. Brown, Akron, Ohio.
 1,141,625. Tire. J. E. Brown, Akron, Ohio.
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 1,141,627. Tire. J. E. Brown, Akron, Ohio.
 1,141,628. Tire. J. E. Brown, Akron, Ohio.
 1,141,629. Tire. J. E. Brown, Akron, Ohio.
 1,141,630. Tire. J. E. Brown, Akron, Ohio.
 1,141,631. Tire. J. E. Brown, Akron, Ohio.
 1,141,632. Tire. J. E. Brown, Akron, Ohio.
 1,141,633. Tire. J. E. Brown, Akron, Ohio.
 1,141,634. Tire. J. E. Brown, Akron, Ohio.
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 1,141,647. Tire. J. E. Brown, Akron, Ohio.
 1,141,648. Tire. J. E. Brown, Akron, Ohio.
 1,141,649. Tire. J. E. Brown, Akron, Ohio.
 1,141,650. Tire. J. E. Brown, Akron, Ohio.

- 1,141,641. Resilient tire. E. Jacquemin, Kent, Wisc.
 1,141,650. Sleeve protector comprising elastic band. S. Rosenbaum and B. Finkelstein, both of Los Angeles, Cal.
 1,141,697. Tire lining. L. P. Des Lauriers, Ware, Mass.
 1,141,708. Method of making tires. J. H. Hill, Wilmington, Del.
 1,141,723. Vehicle tire. T. R. Palmer, Erie, Pa.
 1,141,754. Garment supporter. J. H. Banerji, New York, N. Y.
 1,141,908. Vehicle tire. W. H. Boyes, Brooklyn, N. Y.

Trade Marks.

- 83,545. Automobile Tire Co., Inc., New York, N. Y. The word *Surety*. For rubber pneumatic outer automobile tires or casings and rubber pneumatic inner tubes.
 83,640. The Horace Partridge Co., Boston, Mass. Representation of a seal with a partridge and the word *Partridge's*. For tennis balls, golf balls, etc.
 84,471. The Portage Rubber Co., Akron, Ohio. The word *Portage*. For rubber vehicle tires.
 84,898. Germantown Almegum Manufacturing Co., Philadelphia, Pa. The word *Magic*. For rubber, leather and fabric tires.
 85,320. Pioneer Shoe & Rubber Co., Minneapolis, Minn. Representation of an eye with the words *Bull's Eye*. For waterproof clothing.
 85,498. J. M. Van Heusen, Boston, Mass. A large *L* with the word *Man*. For rubber heels.

ISSUED JUNE 8, 1915.

- 1,141,918. Pneumatic wheel. G. W. Atkinson, Denver, Col.
 1,142,042. Method of making tire covers. J. T. Johnson and F. G. Mason—both of Caulfield, Victoria, Australia.
 1,142,509. Waterproof pocket for bathing suits. A. Ellman and S. Paull, assignors of one-third to S. Gitelman—all of New York, N. Y.
 1,142,526. Vulcanizing apparatus. C. E. Miller, Anderson, Ind.
 1,142,560. Hand stamp. H. S. Folger, Chicago, Ill.
 1,142,561. Hand stamp. H. S. Folger, Chicago, Ill.
 1,142,698. Flexible rubber cup. E. W. Grove and G. P. Crumbaugh—both of St. Louis, Mo.

Designs.

- 47,424. Pneumatic tire. H. R. Holmes, Toronto, Ont., Canada.
 47,431. Automobile tire. H. J. Leah, assignor to Fisk Rubber Co.—both of Chicopee Falls, Mass.

Trade Marks.

- 84,791. E. W. Burt & Co., Inc., Boston, Mass. The words *Rotor Heel*. For leather and rubber heels and rubber inserts.
 85,435. F. M. Fargo, Chicago, Ill. Representation of a shoe and a chicken with the words *Little Chick*. For children's shoes of leather, rubber, etc.
 85,606. C. W. Ebeling, Elm Grove, W. Va. The word *Ch-Lay*. For chewing gum.
 85,644. T. J. Mulcahy, Winthrop, Mass. The word *Endure*. For chewing gum.

UNITED KINGDOM.

PATENT SPECIFICATIONS PUBLISHED.

The number given is that assigned to the Patent at the filing of the application, which in the case of these listed below was in 1914.

*Denotes Patents for American Intentions.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, MAY 12, 1915.]

- 1,102 (1914). Roller for use in grinding and mixing plastic substances for calendering, etc. J. H. Nuttall and D. Bridge & Co., Castleton Ironworks, Castleton, Lancashire.
 1,111 (1914). Rubber sponge. P. Schindrowitz and H. A. Goldborough, 57 Chancery Lane, London.
 1,109 (1914). Washing and like machines for rubber, etc. W. G. Gass, Atlas Foundry, Nelson street, Bolton, Lancashire.
 1,100 (1914). Washing india rubber. W. G. Gass, Atlas Foundry, Nelson street, Bolton, Lancashire.
 1,130 (1914). Mattress composed of a number of inflatable sections. L. E. Patin-Navarro, S. Slet and P. Bergmann, 27 Denigh Place, London.
 1,253 (1914). Rubber heel tread for boots. T. Sieg, 14 Schiller Platz, and R. Völner, 3 Odenburgerstrasse, both in Bielefeld, Germany.
 1,312 (1914). Beer cooling apparatus comprising rubber blocks or rubber faced metal supports. E. Brewster, Station Hotel, Altrincham, Cheshire.
 1,333 (1914). Mouthpiece for regenerative breathing apparatus. Maschinenfabrik "Westfalia" Akt Ges., Gelsenkirchen, Westphalia, Germany.
 1,401 (1914). Elastic leather, comprising a layer of rubberized clumped leather combined with an elastic body. L. Hermann, 78 Walker street, New York, U. S. A.
 1,433 (1914). Circular loom for tubular fabrics, etc. E. C. R. Marks, 57 Finchley Road, London. (Chernack Manufacturing Co., Pawtucket, R. I., U. S. A.)
 1,400 (1914). Rubber covered web feeding rollers. A. L. Lacey, 3 Brierley street, London Road, Manchester.
 1,336 (1914). Rubber tread string shoe. A. J. Mitchell, 1529 New Hampshire avenue, N. W., Washington, U. S. A.

- *1,571 (1914). Protective band for pneumatic tire, comprising layers of rubber. J. E. For, Conshohocken, Pa., U. S. A.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, MAY 19, 1915.]

- 1,526 (1914). Wheel tire. J. A. and T. H. Challiner, "The Glen," Anson Road, Victoria Park, Manchester.
- 1,807 (1914). Heel friction pad. W. C. H. P. and F. A. Hedges, 5, Market street, Brighton, Sussex.
- 1,883 (1914). Utilizing waste rubber. L. Lapasse, 19 Rue de Montreuil, Paris, France.
- *1,886 (1914). Water bag. R. B. Whitmarsh, 624 Marston Freighter Building, Los Angeles, Cal., U. S. A.
- 1,916 (1914). Machine for cutting india rubber tubes into sections of form rings, washers, etc. R. P. Williams, Limited, St. Katerine's Works, Salford, and R. J. Gillespie, 8 Aiden street, both in Edinburgh.
- 1,993 (1914). Golf club with soft rubber striking face. J. Anderson, Croft House, Watworth, Rochdale, Lancashire.
- 2,016 (1914). Pneumatic tire cover. J. W. Anderson, 19 Hess street South, Hamilton, Ont., Canada.
- 2,070 (1914). Natural or synthetic couching. F. L. Matthews and F. H. Strange, 50 City Road, London.
- 1,139 (1914). Felloes and spokes of wheels made from layers of corrugated or fibres impregnated with rubber, or alternating with layers of rubber. Carr Tate Co. and G. D. Rose, Northern Assurance Buildings, Albert Square, Manchester.
- *2,217 (1914). Rectal syringe of the water bottle type. A. C. Eggers, 16 Exchange Place, New York, U. S. A.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, MAY 27, 1915.]

- 2,246 (1914). Wheel tire. J. A. and T. H. Challiner, "The Glen," Anson Road, Victoria Park, Manchester.
- 2,269 (1914). Rubber treated rings for universal joints. E. J. Hardy and E. J. Hardy & Co., 116 Queen Victoria Road, Coventry.
- 2,281 (1914). Coagulating apparatus for india rubber. E. Ripeau, 10 Rue Rodier, Paris.
- 2,336 (1914). Rubber flooring and paving. A. Johnston, 37 Moray Place, and North British Rubber Co., Limited, Castle Mills—both in Edinburgh.
- 2,435 (1914). Wheel tire. M. Boxy, 244 Avenue de la Couronne, Ixelles, Brussels.
- 2,450 (1914). Elastic in bandeaux. G. Godfray, 81 Cavendish street, Keighley, Yorkshire.
- 2,491 (1914). Syringe. L. G. de La Touche, 47 Boulevard Gouvion St. Cyr, and H. Guilbot, 14 Cite Trevisse, both in Paris.
- 2,498 (1914). Molding rubber tires. T. Sloper, Southgate, Devizes, Wilts.
- 2,538 (1914). Latex cup. J. R. Walpole, Broadford, Chobham, Woking, Surrey.
- 2,581 (1914). Ventilator with rubber cushioning strips. E. Berardi, 6 Via Chiatamone, Naples, Italy.
- 2,597 (1914). Bolting with elastic insertions. F. Gaillard, 8 Heath Road, Harrow, Middlesex.
- 2,608 (1914). Window fastening with india rubber cushion. G. Powell, 4 Cewalls Road, and G. Powell, Glenview, both in Bridgend, Glamorganshire.
- 2,647 (1914). Latex coagulating apparatus. H. A. Wickham, Royal Colonial Institute, Northumberland avenue, London.
- 2,678 (1914). Ball or flat valve. J. G. Starr, 51 Denham street, Hawthorn, Victoria, Australia.
- 2,727 (1914). Post marking machine. W. Lyck, 34 Hauptstrasse, Kevelaer, Germany.
- 2,739 (1914). Rubber in producing electric oscillations. R. C. Galletti and R. Manzetti, Champagneux, Savoie, France.
- 2,743 (1914). Elastic device for measuring variation in chest circumference. H. Boller, Weinbergstrasse, Zurich, Switzerland.
- 2,750 (1914). Bathing cap. W. E. Lomas and L. Lomas, Waterloo Buildings, Piccadilly, Manchester.
- 2,819 (1914). Wheel tire. T. K. Clark, Wentworth, Durban, Natal.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, JUNE 2, 1915.]

- *1,832 (1914). Wheel tire. M. Clark, 410 Fine Arts Building, Chicago, Ill., U. S. A.
- 2,887 (1914). Tire tread. North British Rubber Co., Limited, and A. Johnston, both of Castle Mills, Edinburgh.
- 2,917 (1914). Tread projection for wheel tire. J. M. O'Brien, 10 Rydal Road, Streatham, London.
- 3,158 (1914). Rubber coated fabric. W. F. Muntz, 6 Breems Buildings, Chancery Lane, London.
- 3,183 (1914). Window buffer. A. G. Spencer, 77 Cannon street, London.
- 3,184 (1914). India rubber joint making packing. F. Spencer, 77 Cannon street, London.
- *3,228 (1914). Jacket and cover for wheel tire. H. J. Doughty, Edgewood, R. L. U. S. A.
- 3,279 (1914). Brace having elastic sections. P. J. C. Perceau, Nérondes, Cher, France.
- 3,391 (1914). Wheel tire. H. F. G. Bateman and L. C. Bateman, both of 18 The Western Broadway, Hammersmith, London.
- 3,429 (1914). Tread land for wheel tire. F. W. Waggett, 375 Upton Lane, Forest Gate, London.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, JUNE 9, 1915.]

- 3,543 (1914). Brush. H. Round, 141 Great Charles street, Birmingham.
- 3,556 (1914). Wheel tire. C. J. Watts, Hessary, Leigh Road, Southampton.
- 3,562 (1914). Surgical truss. A. H. Holben, 12 Kempton Road, Fulham, London.
- *3,585 (1914). Machine for making elastic foundations. W. C. Stevens, Akron, Ohio, U. S. A.

- 3,603 (1914). Coagulating rubber latex. N. W. Brown, 400 Street, St. Caury.
- 3,643 (1914). Cases for galvanic batteries. U. S. Hart, 100 Westminster Road, Hammersmith, London.
- *3,669 (1914). Wheel tire. J. S. Lyons and G. L. B. and J. E. St. West, Bore, Pa., U. S. A.
- 3,770 (1914). Pneumatic tire fabric. J. Boly, A. Joly, and J. Joly, Leclercq Mills, R. Chilly, France.
- 3,777 (1914). Paving composition of body of water. J. P. Boly, 1, Leclercq, Budapest, Hungary.
- 3,808 (1914). Wheel tire. C. A. Samclart, 1, rue de la République, Paris, U. S. A.
- 3,927 (1914). Sash protector for securing sash cords to the windows of the door. H. W. Rowland, "R. R. Co., 1, Bannock Road, Huddersfield, Lancashire.
- 4,074 (1914). Wheel tire. R. A. Broadbent, 27 Regent Road, Forest Gate, and G. Kensett, "Cheslyn," Blake Hall Road, Wandsworth, both in London.
- 4,100 (1914). Masticating rubber. J. L. Porter, Weymouth Works, Peterborough.

THE FRENCH REPUBLIC.

PATENTS ISSUED (With Dates of Application.)

- 474,879 (May 3, 1915). Detachable interchangeable tool for... E. A. Lemaux and G. M. Guillet.
- 474,929 (January 9). Process for manufacturing and applying a water-proof insulating material. Société Anonyme des Combustibles Industriels.
- 474,945 (July 9). System for splicing tubes. Société Anonyme de Caoutchouc Manufacturé Continental.
- 474,947 (July 9). Improved non-slip soles and heels for shoes. J. H. Turner.
- 475,017 (January 13). Coat tent. Société Anonyme des Filatures, Carderies et Tissages d'Angers.
- 475,047 (January 14). Fabric designed for wrapping electric wires without extra thickness where edges overlap. P. Gallant.
- 475,101 (July 13). Tire. L. Hoss.
- 475,117 (January 20). System for attaching mud guards. C. Geshon and A. Pétard.
- 475,140 (July 15). Pneumatic tire with puncture proof shield. R. Wapshare.
- 475,150 (January 20). Elastic wheel for vehicles. R. Dollard.
- 475,159 (February 20). Improved rubber tires and a perfected system for their attachment and removal. E. B. Killen.
- 475,170 (July 16). Improved couplings for railway carriages and the like. Société Anonyme Westinghouse.

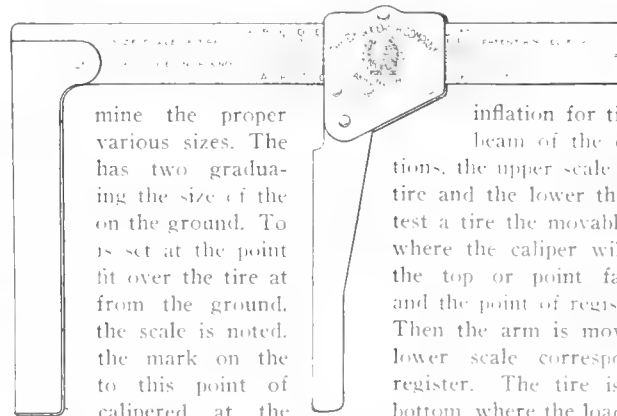
THE GERMAN EMPIRE.

PATENTS ISSUED (With Dates of Validity.)

- 284,683 (April 18, 1914). Emergency rims with mud guards attached. Friedrich Walter, Helmstedt.
- 284,798 (June 2, 1914). Process for manufacturing elastic and plastic material. Julius Stockhausen, Crefeld.
- 284,740 (August 13, 1914). Bandage. Jacob Mehl and Dr. W. Lorentz, Lucka.
- 284,769 (April 11). Vaginal syringe. Walter Uhlenhuth, 1 Schützerstrasse, Sonderhausen.

GOODRICH TIRE CALIPER.

This instrument is used for testing pneumatic tires to deter-



mine the proper various sizes. The has two graduations the size of the on the ground. To is set at the point fit over the tire at from the ground. the scale is noted. the mark on the to this point of calipered at the

inflation for tires of beam of the caliper tions, the upper scale show-tire and the lower the load test a tire the movable arm where the caliper will just the top or point farthest and the point of register on Then the arm is moved to lower scale corresponding register. The tire is then bottom, where the load rests

on it. If the tire is not flattened so that the sides touch the arms of the caliper it should be deflated until the caliper just slips over it; if the tire is too much flattened to permit the caliper to slip over it it should be inflated until its width under load just equals the distance between the arms of the caliper. [The B. F. Goodrich Co., Akron, Ohio.]

Replete with information for rubber manufacturers.—Mr. Pearson's "Crude Rubber and Compounding Ingredients"

Review of the Crude Rubber Market.

NEW YORK.

June 30, 1915.

THE month of June was an extremely quiet one, inquiries were plentiful and several large orders were noted, but general buying was limited. There was little change in prices though there was an upward tendency supported by a steady market in London. It is estimated that 6,500 tons of crude rubber of all sorts was received at the port of New York during May, against 10,148 tons for April.

The usual summer dullness in the rubber mills has not yet made itself manifest and the output of tires continues to make new records. First latex spot sold during the last week of the month at 63 cents and Smoked sheets ribbed were 62¾ cents. Upriver Fine was steady at 62½¢@63 cents. African sorts are arriving in limited quantities; 177 tons was received in New York during May, against 404 tons in April.

The Rubber Control Committee has passed a resolution recommending that all crude rubber importers, brokers and dealers file the British Rubber Guarantees with the Rubber Club for all plantation rubber arriving in this country from the Dutch East Indies.

Arrivals of plantation rubber direct from Batavia have fallen off considerably. In March there was 338 tons; in April, 392 tons, with no arrivals in May.

Arrangements have been completed whereby plantation rubber can now be shipped to any Atlantic port in the United States consigned to the British consul at New York. The usual form of guarantee is required and passed upon by the Rubber Club. Shipments to Pacific ports are consigned to the British consul at San Francisco and cleared in the same manner.

RUBBER AFLOAT.

The Booth Line steamship "Denis" from Manáos and Pará, was due to arrive June 27 with 180 tons. From Singapore and Colombo there are four steamships en route for New York with rubber cargoes, due to arrive within the next six weeks. There are five steamships from London due to arrive in New York with rubber early in July. The steamship "Hubert" sailed from Pará on May 7, for Liverpool, England, with 272 tons of rubber.

The Booth Line steamship "Benedict" sailed from Pará for Liverpool June 5 with 270 tons. The steamship "Anthony," of the same line, sailed from Pará for Liverpool June 10 with 340 tons.

LONDON.

The market was quite firm early in June with satisfactory trading in the standard grades. A feeling of uncertainty as to shipments and the possibility of a long war and large military requirements had a tendency to stiffen prices. Standard crepe, spot, was in demand at 2s. 5d. Smoked sheet, spot, was firm at 2s. 4¾d., and Hard Para was steady at 2s. 7¼d. Inquiries were plentiful and a fairly good business was reported in Standard crepe which is now selling at a premium over Smoked sheet. This is due to the fact that Standard crepe can be used without washing. This saving of time is an advantage in executing Government contracts with a time limit. On June 16 Standard crepe, spot, closed at 2s. 5¾d.; Smoked sheet, spot, at 2s. 5¼d. and Hard Para, at 2s. 7d. The rumor from Singapore of a decreased production in 1915 is not credited here.

Interest in the market during the last week of this month was confined to deliveries on contracts. In the late quotations Standard crepe, spot, sold at 2s. 5¼d.; Smoked sheet, spot, at 2s. 5¾d. and Hard Para was firm at 2s. 7d.

SINGAPORE AND COLOMBO.

At four Singapore auctions held in April last, 632 tons were offered and 293 tons were sold. Pale crepe brought 2s. 4¾d. to 2s. 5½d. The auction of May 11 resulted in 104 tons being sold

out of 134 tons offered. Prices were higher than in April, Pale crepe bringing 2s. 5d. to 2s. 6¾d.

The Colombo weekly auction held on May 6, brought out 143 tons and 130 tons were sold. On May 11 there were 132 tons offered and brought fair prices on a firm market. Pale crepe sold at 2s. 1d. to 2s. 1¼d.

Ocean freights on rubber have again been marked up. From Singapore to London the rate is 101s. 6d. per ton of 50 cubic feet. From Singapore to New York or Boston, direct 112s. and via Europe 131s. 6d. From Colombo to London the rate is 80s. plus 20 per cent. surcharge; to New York, 92s. 6d. plus 50 per cent. surcharge; to the Continent, 80s. plus 20 per cent. surcharge, and to Italian and Spanish ports, 80s. plus 20 surcharge.

NEW YORK QUOTATIONS.

Following are the quotations at New York one year ago, one month ago, and June 30, the current date:

PARA	July 1, '14.	June 1, '15.	June 30, '15.
Upriver, fine, new.....	68½¢@69	61 @	62½¢@63
Upriver, fine, old.....	69½¢@70	.....	63 @65
Islands, fine, new.....	58 @59	52 @	53½¢@54
Islands, fine, old.....	59 @60	.....	55 @57
Upriver, coarse, new.....	39½¢@41	46 @	45½¢@46
Islands, coarse, new	28 @29	28½¢@	28½¢@29
Cameta	31½¢@32½	32 @	31½¢@32
Caucho, upper	39 @40	47½¢@	46 @46½
Caucho, lower	36 @37	44½¢@	43 @44

PLANTATION HEVEA.

Smoked sheet ribbed..57 @63	{ Spot 61 @	63 @
	{ Afloat 61 @	62½¢@63
First latex crepe....{56 @57	Spot 60½¢@	63 @
	Afloat 60½¢@	62½¢@63
Fine sheets and biscuits un-smoked	56 @57½	60 @61

CENTRALS.

Corinto	41 @42	46 @	44 @45
Esmeralda, sausage	39 @40	45 @	44 @45
Nicaragua, scrap	38 @40	.....	.....
Mexican plantation, sheet ..	42 @48	.....	.....
Mexican, scrap	38 @40	.....	44 @
Manicoba, scrap .....	.....	37 @	37 @38
Mangabeira, sheet .....	.....	38 @	38 @39
Guayule	25 @35	29 @	32 @34
Balata, sheet	45 @48	55 @	53 @56
Balata, block .....	.....	45 @	45 @47

AFRICAN.

Lopori, ball, prime	45 @52	53 @55	54 @56
Aruwimi	35 @46	.....	.....
Upper Congo, ball red	38 @42	.....	.....
Ikelemba	35 @45	.....	.....
Sierra Leone, 1st quality..	35 @40	.....	.....
Massai, red	48 @50	54 @	53 @54
Soudan Niggers	38 @40	.....	.....
Cameroon, ball	25 @35	.....	.....
Benguela	27 @32	30 @	32¾¢@33
Accra, flake	22½¢@23	23 @	23 @
Rio Nunez Niggers .....	.....	54 @	55 @56
Konakry Niggers .....	.....	55 @	54 @
Lagos, lump .....	.....	28 @29	.....
Gold Coast, lump .....	.....	27 @28	27 @

EAST INDIAN.

Assam .....	.....	.....	48½¢@49
Pontianak .....	.....	7¼¢@7½	7 @7½
Gutta Siak .....	.....	.....	14 @14½

New York.

In regard to the financial situation, Albert B. Beers (broker in crude rubber and commercial paper, No. 68 William street, New York) advises as follows:

"The same conditions have continued through June as regards commercial paper, as were reported for April and May, money being easy, the best rubber names going at 4@4½ per cent., and those not so well known 5@5½ per cent."

NEW YORK PRICES FOR MAY (NEW RUBBER).

	1915.	1914.	1913.
Upriver, fine	\$0.59 @ 0.61	\$0.70 @ 0.74	\$0.81 @ 0.92
Upriver, coarse	.45 @ .46	.42 @ .46	.54 @ .61
Islands, fine	.52 @ .54	.60 @ .72	.78 @ .83
Islands, coarse	.29 @ .31	.29 @ .32	.38 @ .42
Cameta	.32 @ .34	.33 @ .37	.42 @ .45

IMPORTS FROM PARA AT NEW YORK

[The Figures Indicate Weights in Pounds.]

MAY 17.—By the steamer *Gregory* from Iquitos [Corrected]:

	Fine.	Medium.	Coarse.	Caucho.	Total.
G. Amsinck & Co.	1,300	400	700	130,600	133,000
J. T. Johnstone & Co.	1,100	400	800	60,300	62,600
H. C. Kupper	15,100		3,800	32,800	51,700
H. A. Astlett & Co.	700		300	24,900	25,900
W. R. Grace & Co.	9,500		4,600	7,800	21,900
Total	27,700	800	10,200	250,400	295,100

MAY 21.—By the steamer *Minas Gerais* from Para and Manaos:

Meyer & Brown	65,400	5,500	78,500	87,300	236,700
G. Amsinck & Co.	54,400	1,400	17,100	65,800	138,700
H. A. Astlett & Co.		9,300	30,400	300	40,000
Henderson & Korn	12,000	700	24,800	600	38,100
J. T. Johnstone & Co.				33,600	33,600
Arnold & Zeiss			37,100	1,100	38,200
Hagemeyer & Brunn	30,500				30,500
A. D. Straus & Co.	21,100				21,100
General Rubber Co.			10,400		10,400
Crossman & Siefcken	2,200	600	700	800	4,300
W. R. Grace & Co.	2,700				2,700
Total	188,300	17,500	199,000	189,500	594,300

CENTRALS.

[*This sign, in connection with imports of Centrals, denotes Guayule rubber.]

MAY 20.—By the *Comus*=New Orleans:

E. Steiger & Co. 8,500

MAY 21.—By the *Van der Duyn*=Frontera:

E. Steiger & Co. 22,000

MAY 25.—By the *Asiatic Prince*=Bahia:

Adolph Hirsch & Co. 25,000

J. H. Roszbach Bros. & Co. 52,000

MAY 25.—By the *Byron*=Bahia:

Adolph Hirsch & Co. 22,500

J. H. Roszbach Bros. & Co. 2,500

MAY 26.—By the *Guantanamo*=Mexico:

G. Amsinck & Co. 5,000

Pablo, Calvet & Co. 1,000

J. S. Sembrada & Co. 500

Harburger & Stack 3,000

Graham, Hinkley & Co. 1,000

H. Marquardt & Co. 1,000

American Trading Co. 16,000

Mexican Hardwood Lumber Co. 1,000

MAY 27.—By the *Colorado*=Galveston:

Various 60,000

MAY 28.—By the *Colon*=Colon:

G. Amsinck & Co. 3,800

J. S. Sembrada & Co. 1,100

Pablo, Calvet & Co. 3,700

Hermann Wolff 700

A. M. Capen's Sons 2,200

Andean Trading Co. 3,400

Pottberg, Ebeling & Co. 300

W. R. Grace & Co. 2,900

MAY 28.—By the *Van Hogendorp*=Frontera:

Harburger & Stack 3,000

E. Steiger & Co. 10,000

MAY 28.—By the *Carrillo*=Cartagena:

International Banking Corporation 3,000

Muller, Schall & Co. 500

MAY 28.—By the steamer *Stephen* from Para and Manaos:

	Fine	Medium	Coarse	Caucho	Total
Meyer & Brown	26,900	15,500	17,500	52,600	205,900
General Rubber Co.	33,800	11,500	17,500		563,200
H. A. Astlett & Co.	1,800	12,500	4,900	36,900	96,100
Robinson & Co.	44,400		21,800		66,200
Arnold & Zeiss	27,500	1,100	15,900	100	44,600
Henderson & Korn	4,300	2,500	31,400	1,700	39,900
G. Amsinck & Co.	200	100	5,400	24,800	30,500
Adolph Hirsch & Co.			20,900	1,300	22,200
J. T. Johnstone & Co.			3,700	15,900	19,600
Total	61,900	43,600	249,400	133,500	1,085,000

JUNE 8.—By the steamer *Atahualpa* from Para and Manaos:

Meyer & Brown	4,900		18,600	42,700	66,200
Arnold & Zeiss	24,500	1,400	51,900	109,600	187,800
Henderson & Korn	19,600	100	64,700	32,700	117,100
W. R. Grace & Co.				22,000	22,000
Robinson & Co.	5,000	3,000	11,000	21,100	21,100
J. T. Johnstone & Co.			9,700	7,300	17,000
G. Amsinck & Co.	7,500	800	600		9,300
Total	6,300	5,300	156,500	216,400	440,500

JUNE 8.—By the steamer *Atahualpa* from Iquitos:

G. Amsinck & Co.	3,800		200	15,000	19,100
W. R. Grace & Co.	2,800		600	6,600	64,000
J. T. Johnstone & Co.	1,700		700	13,300	15,200
Rumsey & Greutert Co., Inc.	800		300	1,700	2,800
Total	9,100		1,600	90,600	101,100

JUNE 14.—By the steamer *Alban* from Para:

Meyer & Brown	53,200	2,500	149,500	18,400	223,600
Hagemeyer & Brunn	165,700		53,100	23,200	242,000
Arnold & Zeiss	60,700	23,600	73,300	13,800	172,400
H. A. Astlett & Co.	53,600		21,900	19,700	95,200
Henderson & Korn	14,000	9,100	51,000	8,400	82,500
General Rubber Co.	63,400	9,300	4,600		77,300
G. Amsinck & Co.	39,000	700	17,700	15,100	72,500
J. T. Johnstone & Co.	11,800	6,800		38,800	57,400
Muller, Schall & Co.	23,700		12,000	11,800	47,500
Mecke & Co.				42,200	42,200
Neuss, Hesselein & Co.	19,700		6,300		26,000
W. R. Grace & Co.	11,600		3,200		14,800
Total	516,400	52,000	393,600	191,400	1,153,400

MAY 29. By the *Vasari*=Bahia:

Adolph Hirsch & Co. 12,500

MAY 29.—By the *San Jacinto*=Galveston:

Various 67,000

JUNE 1.—By the *El Occidente*=Galveston:

Various 230,000

JUNE 1.—By the *Sixola*=Cartagena:

G. Amsinck & Co. 100

Rosenthal & Sons 300

Eggers & Heinlein 100

JUNE 3.—By the *El Rio*=New Orleans:

Various 40,000

JUNE 4.—By the *Santa Marta*=Cartagena:

De Lima, Cortissoz & Co. 2,000

G. Amsinck & Co. 500

JUNE 4.—By the *El Alba*=Galveston:

Various 10,000

JUNE 7.—By the *Advance*=Colon:

G. Amsinck & Co. 16,200

Piza, Nephews & Co. 2,500

Meyer Hecht 1,700

JUNE 7.—By the *Morro Castle*=Mexico:

J. A. Medina & Co. 1,800

General Export & Commission Co. 700

H. Marquardt & Co. 200

JUNE 7.—By the *El Siglo*=Galveston:

Various 67,000

JUNE 7.—By the *Sibiria*=Frontera:

E. Steiger & Co. 12,000

General Export & Commission Co. 3,000

JUNE 8.—By the *Metapan*=Port Limon:

Isaac Brandon & Bros. 1,000

JUNE 9.—By the *Gistich*=Colon:

G. Amsinck & Co. 7,600

J. S. Sembrada & Co. 2,300

Pablo, Calvet & Co. 2,700

A. M. Capen's Sons 1,500

JUNE 10.—By the *Camaguey*=Mexico:

Laurence Johnson & Co. 9,000

JUNE 10. By the *Almirante*=Cartagena:

G. Amsinck & Co. 3,000

A. Held 1,500

International Banking Corp. 6,000

JUNE 14.—By the *Pastores*=Port Limon:

Isaac Brandon & Bros. 1,000

G. Amsinck & Co. 200

JUNE 14.—By the *Trinity*=Port Limon:

A. Rosenthal & Sons 500

JUNE 14.—By the *La Munda*=Galveston:

G. Amsinck & Co. 22,500

JUNE 18.—By the *Alma*=Colon:

G. Amsinck & Co. 6,200

Charles Griffin & Co. 3,700

Andean Trading Co. 2,900

JUNE 21. By the *Meda*=Mexico:

Lawrence Johnson & Co. 9,600

J. A. Medina & Co. 300

General Export Commission Co. 1,000

Diethin & Co. 600

Diaz & Co. 1,200

JUNE 21.—By the *El Sol*=Galveston:

Various 125,000

JUNE 21. By the *Comar*=Bahia:

Adolph Hirsch & Co. 15,600

Roszbach Bros. 5,000

Aldens' Successors, Ltd. 29,000

JUNE 22.—By the *Cinamara*=Port Limon:

Isaac Brandon & Bros. 2,000

A. A. Linde & Co. 1,000

AFRICANS.

JUNE 1.—By the *Lapland*=Liverpool:

Edward Maurer Co., Inc. 11,200

JUNE 1. By the *Tigra*=Lisbon:

Edward Maurer Co., Inc. 50,000

Robert Badenhop 2,500

S. R. Sequerra 112,000

JUNE 2.—By the *Roma*=Lisbon:

S. R. Sequerra 45,000

May 27. By the <i>St. James</i> —London:	
General Rubber Co.	*125,000
June 1. By the <i>St. James</i> —London:	
Goodyear Tire & Rubber Co.	*1,000
I. Blitz *	223,200
June 1. By the <i>St. James</i> —London:	
Raw Products Co.	*11,200
June 1. By the <i>St. James</i> —London:	
Meyer & Brown *	9,000
General Rubber Co.	*2,500
Arnold & Zeiss *	78,000
J. T. Johnstone & Co.	*100,000
L. Littlejohn & Co.	*20,000
Henderson & Korn *	190,000
Aldens' Successors, Ltd.	*60,000
Edward Maurer Co., Inc.	*18,000
I. Blitz *	5,600
Rubber Trading Co.	*22,000
Various *	95,000
June 3. By the <i>St. James</i> —London:	
The B. F. Goodrich Co.	*4,500
June 3. By the <i>St. James</i> —London:	
J. T. Johnstone & Co.	*80,000
The B. F. Goodrich Co.	*100,000
L. Littlejohn & Co.	*75,000
Goodyear Tire & Rubber Co.	*50,000
June 4. By the <i>St. James</i> —London:	
Meyer & Brown *	3,600
General Rubber Co.	*34,000
Goodyear Tire & Rubber Co.	*265,000
The B. F. Goodrich Co.	*260,000
Arnold & Zeiss *	50,000
L. Littlejohn & Co.	*13,000
Various *	2,000
June 5. By the <i>St. James</i> —London:	
Meyer & Brown *	2,270
Arnold & Zeiss *	60,000
General Rubber Co.	*200,000
The B. F. Goodrich Co.	*195,000
L. Littlejohn & Co.	*48,000
Henderson & Korn *	75,000
Rubber Trading Co.	*25,000
Robinson & Co.	*7,000
Aldens' Successors, Ltd.	*30,000
J. T. Johnstone & Co.	*30,000
Edward Maurer Co., Inc.	*60,000

EAST INDIAN

Imports of rubber from

May 27. By the <i>St. James</i> —London:	
General Rubber Co.	*125,000
June 1. By the <i>St. James</i> —London:	
Goodyear Tire & Rubber Co.	*1,000
I. Blitz *	223,200
June 1. By the <i>St. James</i> —London:	
Raw Products Co.	*11,200
June 1. By the <i>St. James</i> —London:	
Meyer & Brown *	9,000
General Rubber Co.	*2,500
Arnold & Zeiss *	78,000
J. T. Johnstone & Co.	*100,000
L. Littlejohn & Co.	*20,000
Henderson & Korn *	190,000
Aldens' Successors, Ltd.	*60,000
Edward Maurer Co., Inc.	*18,000
I. Blitz *	5,600
Rubber Trading Co.	*22,000
Various *	95,000
June 3. By the <i>St. James</i> —London:	
The B. F. Goodrich Co.	*4,500
June 3. By the <i>St. James</i> —London:	
J. T. Johnstone & Co.	*80,000
The B. F. Goodrich Co.	*100,000
L. Littlejohn & Co.	*75,000
Goodyear Tire & Rubber Co.	*50,000
June 4. By the <i>St. James</i> —London:	
Meyer & Brown *	3,600
General Rubber Co.	*34,000
Goodyear Tire & Rubber Co.	*265,000
The B. F. Goodrich Co.	*260,000
Arnold & Zeiss *	50,000
L. Littlejohn & Co.	*13,000
Various *	2,000
June 5. By the <i>St. James</i> —London:	
Meyer & Brown *	2,270
Arnold & Zeiss *	60,000
General Rubber Co.	*200,000
The B. F. Goodrich Co.	*195,000
L. Littlejohn & Co.	*48,000
Henderson & Korn *	75,000
Rubber Trading Co.	*25,000
Robinson & Co.	*7,000
Aldens' Successors, Ltd.	*30,000
J. T. Johnstone & Co.	*30,000
Edward Maurer Co., Inc.	*60,000

Rumsey & Greutert Co., Inc.	*20,000
Charles T. Wilson Co., Inc.	*170,000
Hood Rubber Co.	*5,000
H. L. & Co.	*15,000
Robert Badenhop *	22,000
Various *	200,000
June 7. By the <i>St. James</i> —London:	
General Rubber Co.	*11,200
June 7. By the <i>St. James</i> —London:	
Meyer & Brown *	45,000
General Rubber Co.	*200,000
L. Littlejohn & Co.	*59,000
Various *	59,000
June 9. By the <i>St. James</i> —London:	
Meyer & Brown *	28,000
General Rubber Co.	*45,000
L. Littlejohn & Co.	*60,000
June 9. By the <i>St. James</i> —London:	
Meyer & Brown *	6,000
General Rubber Co.	*125,000
J. T. Johnstone & Co.	*70,000
L. Littlejohn & Co.	*27,000
Edward Maurer Co., Inc.	*17,000
Various *	60,000
June 14. By the <i>St. James</i> —London:	
The B. F. Goodrich Co.	*7,000
June 15. By the <i>St. James</i> —London:	
General Rubber Co.	*180,000
L. Littlejohn & Co.	*40,000
Various *	40,000
June 15. By the <i>St. James</i> —London:	
Robinson & Co.	*12,500
Charles T. Wilson Co., Inc.	*65,000
Robert Badenhop *	12,500
General Rubber Co.	*625,000
Goodyear Tire & Rubber Co.	*85,000
L. Littlejohn & Co.	*15,862
June 17. By the <i>St. James</i> —London:	
Meyer & Brown *	35,000
L. Littlejohn & Co.	*11,000
Aldens' Successors, Ltd.	*84,000
J. T. Johnstone & Co.	*90,000
Henderson & Korn *	67,000
General Rubber Co.	*400,000
The B. F. Goodrich Co.	*29,000
Edward Maurer Co., Inc.	*25,000
Rumsey & Greutert Co., Inc.	*4,000
Hadden & Co.	*10,000
Robinson & Co.	*17,000
Arnold & Zeiss *	12,500
Rubber Trading Co.	*50,000
Various *	77,000
June 19. By the <i>St. James</i> —London:	
Meyer & Brown *	21,000
General Rubber Co.	*410,000
Manhattan Rubber Mfg. Co.	*27,000
Goodyear Tire & Rubber Co.	*90,000
Aldens' Successors, Ltd.	*190,000
J. T. Johnstone & Co.	*45,000
Various *	458,000
June 21. By the <i>St. James</i> —London:	
Meyer & Brown *	22,700
Charles T. Wilson Co., Inc.	*90,000
Robert Badenhop *	11,000
Hood Rubber Co.	*33,500
Edward Maurer Co., Inc.	*80,000
Robinson & Co.	*17,000
Goodyear Tire & Rubber Co.	*50,000
June 21. By the <i>St. James</i> —London:	
Meyer & Brown *	45,000
Aldens' Successors, Ltd.	*35,000
Henderson & Korn *	115,000
General Rubber Co.	*85,000

Arnold & Zeiss *	45,000
Robinson & Co.	*22,500
J. T. Johnstone & Co.	*11,200
Charles T. Wilson Co., Inc.	*2,200
Rubber Trading Co.	*22,000
Edward Maurer Co., Inc.	*4,500
Various *	23,000
June 21. By the <i>St. James</i> —London:	
Meyer & Brown *	75,000
L. Littlejohn & Co.	*97,500
J. T. Johnstone & Co.	*6,000
Edward Maurer Co., Inc.	*11,200
Henderson & Korn *	45,000
Aldens' Successors, Ltd.	*11,200
Various *	3,800
June 21. By the <i>St. James</i> —London:	
Meyer & Brown *	75,000
General Rubber Co.	*100,000
Edward Maurer Co., Inc.	*40,000
Goodyear Tire & Rubber Co.	*60,000
J. T. Johnstone & Co.	*6,000
Rubber Trading Co.	*22,500
Aldens' Successors, Ltd.	*3,000
Various *	345,100

PARA RUBBER VIA EUROPE.

June 10. By the <i>Queen Vaguet</i> —London:	
Raw Products Co. (Coarse)	22,500
June 11. By the <i>Queen Vaguet</i> —London:	
Rubber & Guayule Agency, Inc. (Fine) ..	3,700
June 11. By the <i>Queen Vaguet</i> —London:	
Muller, Schall & Co. (Fine) ..	37,200
Muller, Schall & Co. (Coarse) ..	300

CUSTOM HOUSE STATISTICS.

PORT OF NEW ORLEANS MAY, 1915.		
Imports.	Pounds.	Value.
India rubber *	112,317	\$41,633
PORT OF CHICAGO MAY, 1915.		
Imports:		
Rubber scrap *	41,344	\$2,813
PORT OF SAN FRANCISCO MAY, 1915.		
Imports:		
India rubber crude *	6,077	\$4,177
India rubber scrap *	24,120	1,050
PORT OF DETROIT MAY, 1915.		
Exports:		
Rubber scrap *	2,690	\$166
Rubber reclaimed *	40,031	3,753
PORT OF CLEVELAND MAY, 1915.		
Imports:		
India rubber *	46,213	\$26,086
Scrap rubber *	400	22
PORT OF BOSTON MAY, 1915.		
Imports:		
Gutta jelutong *	124,266	\$8,307
India rubber *	426	304
PORT OF NIAGARA FALLS MAY, 1915.		
Imports:		
Rubber scrap *	30,000	\$2,130
PORT OF PHILADELPHIA MAY, 1915.		
Imports:		
Rubber scrap *	5,05	\$369

EXPORTS OF INDIA RUBBER FROM MANAOS DURING THE MONTH OF APRIL, 1915.

IMPORTERS	NEW YORK.					EUROPE					T. VAL.	GRAND TOTAL.
	Fine.	Medium.	Coarse.	Caucho.	Latex.	Fine.	Medium.	Coarse.	Caucho.			
S. W. & Co.			18,288		78,588	65,972	4,916	2,324	84,449	157,661	175,949	
Goodyear Rubber Co.			26,569	8,434	31,8	145,638	44,851	2,265	101,502	314,606	339,714	
Pralow & Co.	41,216		36,577	13,748	90,691	119,626	18,860	7,797	32,825	179,102	269,793	
Various *						108,322	22,993	30,407	58,558	220,280	2,128	
Goodyear Tire & Rubber Co.			3,14		2,14	71,155	12,927	8,978	5,617	118,677	150,219	
L. Littlejohn & Co.					8,87	30,280	4,903	8,709	30,055	73,947	102,817	
Henderson & Korn *					84	69,993	9,660	4,8		83,873	84,713	
Rubber Trading Co.						26,969			3,343	30,312	30,312	
Robinson & Co.					7,27	8,004		84		9,340	16,975	
Aldens' Successors, Ltd.								61	29	7,638	7,728	
J. T. Johnstone & Co.			1,263		88						2,208	
Edward Maurer Co., Inc.											880	
Various *								510		860	86	
June 1. By the <i>St. James</i> —London:												
Meyer & Brown *												
General Rubber Co.												
Goodyear Tire & Rubber Co.												
The B. F. Goodrich Co.												
L. Littlejohn & Co.												
Henderson & Korn *												
Rubber Trading Co.												
Robinson & Co.												
Aldens' Successors, Ltd.												
J. T. Johnstone & Co.												
Edward Maurer Co., Inc.												
Various *												
June 3. By the <i>St. James</i> —London:												
Meyer & Brown *												
Arnold & Zeiss *												
General Rubber Co.												
The B. F. Goodrich Co.												
L. Littlejohn & Co.												
Goodyear Tire & Rubber Co.												
June 4. By the <i>St. James</i> —London:												
Meyer & Brown *												
Arnold & Zeiss *												
General Rubber Co.												
The B. F. Goodrich Co.												
L. Littlejohn & Co.												
Henderson & Korn *												
Rubber Trading Co.												
Robinson & Co.												
Aldens' Successors, Ltd.												
J. T. Johnstone & Co.												
Edward Maurer Co., Inc.												
Various *												
June 5. By the <i>St. James</i> —London:												
Meyer & Brown *												
Arnold & Zeiss *												
General Rubber Co.												
The B. F. Goodrich Co.												
L. Littlejohn & Co.												
Goodyear Tire & Rubber Co.												
June 7. By the <i>St. James</i> —London:												
Meyer & Brown *												
General Rubber Co.												
L. Littlejohn & Co.												
Various *												
June 9. By the <i>St. James</i> —London:												
Meyer & Brown *												
General Rubber Co.												
L. Littlejohn & Co.												
Various *												
June 11. By the <i>St. James</i> —London:												
Meyer & Brown *												
General Rubber Co.												
L. Littlejohn & Co.												
Various *												
June 13. By the <i>St. James</i> —London:												
Meyer & Brown *												
General Rubber Co.												
L. Littlejohn & Co.												
Various *												
June 15. By the <i>St. James</i> —London:												
Meyer & Brown *												
General Rubber Co.												
L. Littlejohn & Co.												
Various *												
June 17. By the <i>St. James</i> —London:												
Meyer & Brown *												
General Rubber Co.												
L. Littlejohn & Co.												
Various *												
June 19. By the <i>St. James</i> —London:												
Meyer & Brown *												
General Rubber Co.												
L. Littlejohn & Co.												
Various *												
June 21. By the <i>St. James</i> —London:												
Meyer & Brown *												
General Rubber Co.												
L. Littlejohn & Co.												
Various *												
June 23. By the <i>St. James</i> —London:												
Meyer & Brown *												
General Rubber Co.												
L. Littlejohn & Co.												
Various *												
June 25. By the <i>St. James</i> —London:												
Meyer & Brown *												
General Rubber Co.												
L. Littlejohn & Co.												
Various *												
June 27. By the <i>St. James</i> —London:												
Meyer & Brown *												
General Rubber Co.												
L. Littlejohn & Co.												
Various *												
June 29. By the <i>St. James</i> —London:												
Meyer & Brown *												
General Rubber Co.												
L. Littlejohn & Co.												
Various *												
June 31. By the <i>St. James</i> —London:												
Meyer & Brown *												
General Rubber Co.												
L. Littlejohn & Co.												
Various *												
GRAND TOTAL.												

United Kingdom.

IMPORTS OF RUBBER.

	Month ending May 31.			Five months ending May 31.		
From—	1913.	1914.	1915.	1913.	1914.	1915.
Dutch East Indies.....	127	35	87	.....	.....	970
French West Africa.....	113	18	69	317	192	207
Gold Coast.....	.....	.....	109	.....	.....	1,033
Other Countries in Africa.....	88	118	105	566	408	454
Peru.....	1,933	1,305	1,801	9,720	7,645	6,551
British India.....	.....	.....	44	.....	.....	776
Straits Settlements and Dependent encies, including Labuan.....	1,145	1,515	2,127	6,001	8,144	14,914
Federated Malay States.....	831	591	1,030	4,040	4,515	5,404
Ceylon and Dependencies.....	289	481	666	2,372	3,136	7,280
Other Countries.....	1,587	1,180	134	7,829	6,431	773
Total	6,115	5,240	6,381	31,721	31,139	38,449
*Waste and Reclaimed.....	.....	.....	188	.....	.....	567
Total.....	.....	.....	6,569	.....	.....	39,016
Gutta Percha.....	429	201	331	2,031	1,216	1,478

EXPORTS OF RUBBER.

To—	1913.	1914.	1915.
Russia.....	633	907	2,371
Germany.....	1,073	1,166	4,679
Belgium.....	164	169	833
France.....	438	707	733
United States.....	1,361	2,709	6,550
Other Countries.....	411	294	764
Total.....	4,080	5,952	7,869
*Waste and Reclaimed.....	.....	.....	32
Total.....	.....	.....	7,901
Gutta Percha.....	52	12	54

*Included in "Rubber" prior to 1915.

Plantation Rubber From the Far East.

EXPORTS OF CEYLON GROWN RUBBER.

(From January 1 to May 17, 1914 and 1915. Compiled by the Ceylon Chamber of Commerce.)

To—	1914.	1915.
Great Britain.....	6,041,603	10,077,699
United States.....	3,321,834	4,234,850
Belgium.....	1,946,292	.....
Germany.....	667,047	.....
Japan.....	152,511	164,479
France.....	98,873	150,080
Russia.....	98,482	287,650
Australia.....	44,423	144,358
Straits Settlements.....	35,852	116,056
India.....	599	500
Canada and Newfoundland.....	.....	340,140
Total.....	12,407,417	15,515,812

(Same period 1913, 8,083,692 pounds; same period 1912, 4,077,628.)

The export figures of rubber given in the above table for 1914 include the imports re-exported. (These amount to 1,563,077 pounds.) To arrive at the total quantity of Ceylon rubber exported for that period deduct these imports from the total exports. The figures for 1915 and 1912 are for Ceylon rubber only.

TOTAL EXPORTS FROM MALAYA

(From January to dates named. Reported by Barlow & Co., Singapore. These figures include the production of the Federated Malay States, but not of Ceylon.)

To—	Singapore, March 21.	Malacca, April 30.	Penang, March 31.	Port Swet- tenham, April 15.	Total.
Great Britain.....	10,903,945	3,276,002	6,668,532	9,313,019	30,161,498
Continental.....	1,879,457	.....	149,999	11,200	1,540,656
Japan.....	80,659	.....	.....	.....	80,659
Ceylon.....	47,523	.....	118,133	511,884	677,540
United States.....	2,076,533	.....	110,000	.....	3,086,533
Australia.....	129,960	.....	.....	.....	129,960
Total.....	15,518,077	3,276,002	7,046,664	9,836,103	35,676,846
Total, 1914.....	8,757,513	1,772,517	5,398,000	8,733,149	24,661,191
Total, 1913.....	8,376,298	.....	3,503,067	8,552,277	17,431,642
Total, 1912.....	2,668,545	.....	2,434,719	4,753,493	10,156,757

SINGAPORE.

Guthrie & Co., Ltd., report [May 11, 1915]:

Yesterday's advices from London indicated a better demand in the rubber market and this was reflected at the association auction held today, prices generally being better on the week.

Fine ribbed smoked sheet and fine pale crepe were both in good demand. For one or two lots of both grades quite exceptional prices were obtained but on the average there was an improvement of about \$5 per picul. Un-smoked sheet was also wanted, but here, too, values were most erratic. Brown and dark crepes moved off freely at an advance of about \$4 per picul, but larky crepes were practically unchanged.

Virgin scrap showed no change from last week but loose scrap improved considerably.

Of 134 tons offered 104 tons changed hands.

The following was the course of values:

	In Singapore, Picul.	Sterling equivalent per 100 pounds in London.	Equivalent per pound in cents.
Sheet, fine ribbed smoked....	\$127@134	2 5 3/4	58.79@61.57
Sheet, fine to good ribbed smoked.....	120@124	2 3 1/2	55.75@57.27
Sheet, pale smoked.....	115@117	2 1 1/2	51.70@52.79
Sheet, un-smoked.....	108@125	2 1 1/4	50.68@57.77
Crepe, fine pale.....	127@134	2 5 3/4	58.79@61.57
Crepe, good pale.....	115@119	2 3 1/2	56.50@58.28
Crepe, fine brown.....	111@119	2 1 1/2	53.46@55.73
Crepe, good brown.....	106@109	1 11 1/2	50.93@52.24
Crepe, bark.....	95@105	1 10 1/4	45.10@49.16
Slab, vulcanized.....	85@96	1 8 1/4	41.06@43.33
Slab, bark.....	76@91	1 6 1/4	38.26@43.33

*Picul = 133 1/3 pounds.

†Picul = 133 1/3 pounds.

THE RUBBER SCRAP MARKET.

A VERY quiet market and easy prices ruled in the rubber waste trade in June. Conservative buying was confined to small lots, and attractive prices on large lots failed to interest the consumers. The mills appeared to be holding off and waiting developments. Boots and shoes were easier and offers at 7 1/2 cents, delivered, were made to the mills. There was no change in auto. tires. A few sales of Goodrich and Goodyear white tires were reported at 6 1/4 cents delivered. Manufacturers report a good demand for rubber goods and this should have a favorable influence on the scrap market. The fact that there is an ample supply of crude rubber, doubtless explains the present stagnation.

The demand continues to be wholly routine with the market quiet and prices steady. Imports of foreign scrap are small in volume and the mills are only taking enough for their immediate needs. The following imports were received at the port of New York during the month: June 1, by the steamship "Saratoga" from Havana, 15 packages consigned to the American Trading Co., and 29 packages for Yglesias, Lobo & Co.; June 4, by the "Egbert" from Hongkong, 112 barrels for Muller, Schall & Co.; by the "Samland," 22 bags consigned to the British Consul; June 6, by the "Largo Law" from London, 22 bags consigned to the British Consul; by the "Maracaibo" from Guayra, 18 barrels for DeSola Brothers & Pardo; June 7, by the "Advance," from Panama, 6 barrels for Pottberg, Ebeling & Co.; June 21, by the "Steven," from London, 31 packages and 18 bags consigned to the Guaranty Trust Co.; June 23, by the "Havana," from Havana, 27 packages for Yglesias Lobo & Co.

PRICES PAID BY CONSUMERS FOR CARLOAD LOTS.

New York, June 25, 1915.

	Per Pound.
Boots and shoes.....	7 1/2 @ 7 1/4
White Goodrich and Goodyear tires.....	6 1/2 @ 6 3/4
Morgan & Wright and U. S. tires.....	5 1/2 @ 5 3/4
Trimmed scrap.....	6 1/2 @ 6 1/4
Auto tires, mixed.....	4 3/4 @ 5
Solid tires.....	4 1/2 @ 4 3/4
No. 1 inner tubes.....	25 @ 25 1/2
No. 2 inner tubes.....	11 1/2 @
Rel. tubes.....	13 @ 13 1/2
Bicycle tires.....	3 @ 3 1/4
Irony tires.....	1 1/2 @ 2 1/2
No. 1 auto patches.....	8 @ 8 1/2
Mixed auto patches.....	6 1/2 @ 7
No. 1 soft white rubber.....	11 @ 12
White wing rubber.....	9 1/2 @ 9 1/2
No. 1 red scrap.....	10 @ 10 1/2
Mixed red scrap.....	7 1/2 @ 7 1/2
Mixed black scrap.....	5 @ 5 1/4
Rubber car springs.....	3 1/2 @
Horse shoe pads.....	3 @ 3 1/2
Mattings and packing.....	1 @ 1 1/4
Garden hose.....	4 1/2 @ 4 1/2
Air brake hose.....	4 1/2 @ 4 1/2
Cotton clothes.....	1 1/2 @ 2

CANADIAN MARKET.

The market has been generally quiet and trading restricted to small lots of shoes and special tires. There has not been enough consistent buying to materially change prices. In shipping carload lots of rubber scrap from Canada to the United States, special permits are issued by the Commissioner of Customs at Ottawa and the goods are consigned to the British Consul, who releases them at their destination upon filing of the customary rubber guarantees. The Rubber Club of America, Inc., attends to these details, making a charge of 50 cents a ton, which is paid by the consumer.



Vol. 52.

JULY 1, 1915.

No. 4.

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AN UNFORTUNATE MISAPPREHENSION.

TO the Editor of THE INDIA RUBBER WORLD:

I am writing you today to call your attention to an article which is going the rounds of the German press, namely, that the Rubber Club of America has come out with a circular in which they inform those interested in the branch that goods for Germany will not be exported, calling attention to the fact that goods will be taken for transportation to Great Britain.

The matter is very plain to us, but is being wrongly construed by the German press, which argues that this export has been forbidden to Germany, but not to England. The situation is very simple, although in reality very complicated, as all goods sent to Germany, or addressed to German firms, or even to American firms in Germany (we greatly regret to say) are confiscated by the British government, and not allowed to reach their destination.

We should feel under great obligation to you would you look into this matter and see if it cannot be straightened out, so as not to give the impression that American firms do not wish to send goods to Germany, but will send them to England.

We trust you will continue to send us THE INDIA RUBBER WORLD regularly, as our second-class matter reaches us more promptly than first-class matter, which latter is always subject to a delay.

Very sincerely yours,
GEO. S. ATWOOD,
Secretary, American Association of Commerce and Trade.
Berlin, Germany, May 25, 1915.

[It is obvious from the letter printed above that the German press entirely misapprehends the rubber situation in the United States. This matter has been explained several times in these columns and particularly in the editorial that appeared in the May issue. The British Government put an embargo on rubber from the English plantations in the East. American manufacturers needed this rubber and in order to obtain it agreed to the terms of the British Government, namely—that if shipments of plantation rubber from London to American ports were resumed, none of it, either in its crude or manufactured form, should be permitted to reach the enemies of the Allies. This agreement was entered into by the American manufacturers as being the only way in which they could secure the necessary supply of rubber. It indicates no feeling in any direction, either of friendliness for England or unfriendliness for Germany.—Editor.]

RECENT CUSTOMS RULINGS.

The protest by the Max Frankel Co., against a 50 per cent. assessment on bottle stoppers composed of china and rubber as being chiefly of china, has been sustained, and these articles have been declared dutiable at 10 per cent., as manufactures in chief value of rubber.

The B. F. Goodrich Co. has also been sustained in its protest against a 15 per cent. assessment on heavy wire forms, and by the decision of the Board of General Appraisers these have been allowed free entry, as wire staples.

TO DISTRIBUTE AMERICAN RUBBER GOODS IN BELGIUM.

An organization of Belgian business men has been created for the purpose of introducing into Belgium, as soon as the war is over, all kinds of American products and manufactures. There is a secondary object in this organization, namely, to find employment as agents and distributors of American goods for a large number of Belgian manufacturers and business men who have been financially ruined or at least very seriously embarrassed by the war. Mr. Willy Lamot, Sharnhighs, Halstead (Essex), England, is acting as secretary for this organization.

The variety of materials used in the preparation of rubber and the production of rubber goods is evidenced by the statement recently made by William H. Scheel, of 159 Maiden Lane, New York, dealer in rubber workers' supplies, that he is prepared to supply practically 200 products suitable for this purpose.

products not as good as
it to be? Probably I can
how to make them right.
anyway.

WICK J. MAYWALD, F.C.S.
CONSULTING CHEMIST
'Phone, 823 John New York

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PAGE 73

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Edited by HENRY C. PEARSON—Offices, No. 25 West 45th Street, NEW YORK.

Vol. LII. No. 5.

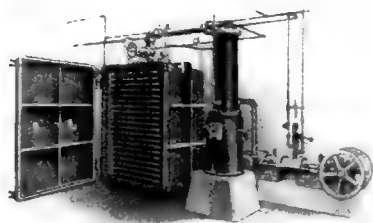
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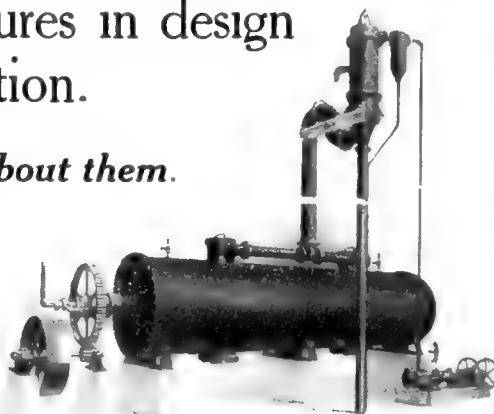
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Published on the 1st of each Month by

THE INDIA RUBBER PUBLISHING CO.

No. 25 West 45th Street, New York.

CABLE ADDRESS: IRWORLD, NEW YORK.

HENRY C. PEARSON, Editor

Vol. 52.

AUGUST 1, 1915.

No. 5

SUBSCRIPTIONS: \$3.00 per year, \$1.75 for six months, postpaid, for the United States and dependencies and Mexico. To the Dominion of Canada and all other countries, \$3.50 (or equivalent funds) per year, postpaid.

ADVERTISING: Rates will be made known on application.

REMITTANCES: Should always be made by bank draft or Postoffice or Express money order on New York, payable to THE INDIA RUBBER PUBLISHING COMPANY. Remittances for foreign subscriptions should be sent by International Postal Order, payable as above.

DISCONTINUANCES: Yearly orders for subscriptions and advertising are regarded as permanent, and after the first twelve months they will be discontinued only at the request of the subscriber or advertiser. Bills are rendered promptly at the beginning of each period, and thereby our patrons have due notice of continuance.

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Entered at the New York postoffice as mail matter of the second class.

TABLE OF CONTENTS ON LAST PAGE OF READING.**SHALL WE KEEP THE FAITH?**

UNDER the agreement made last January between the British government and the Rubber Club of America, and subscribed to by all the important members of the American trade, the manufacturers agreed, if the embargo on crude rubber were lifted, not to sell rubber either in its crude or manufactured form to any of the enemies of Great Britain or to any neutral country except by way of the United Kingdom. This agreement appears faithfully to have been kept.

But there was a secondary contract, a natural and necessary corollary of the first, which read as follows:

"We will not sell any manufactured or partly manufactured rubber goods to any person in the United States without satisfying ourselves that there is no intention on his part to export or resell the same for exportation to any countries in Europe other than Great Britain, France, Russia or Italy, otherwise than by shipping to the United Kingdom and reshipping from there under license to be obtained for export therefrom."

That this part of the understanding with the British government has been scrupulously observed appears to be open to grave question. The statement is made on authority not open to contradiction that during the six months since the embargo was lifted many ships clearing from New York for Scandinavian and Mediterranean ports have carried motor cars fully equipped with rubber

tires. The car makers from whose factories these shipments were made cannot plead ignorance of the agreement as to sales in neutral countries, as all the members of the automobile trade must have been apprised of it repeatedly and emphatically.

It would seem as if some members of the automobile trade took the attitude that the agreement was none of their making and hence none of their concern. If such is the case, there is only one possible course to pursue. If the tire manufacturer finds that he cannot control a certain maker of cars, his supply of tires should be instantly stopped. In view of the guarantees he has signed, the seller of tires can do no less.

There are some in the trade who profess to believe that the English, receiving considerably more rubber than they need, and being more than willing to exchange the surplus for ready cash, would be slow to invoke the embargo again even though considerable quantities of rubber goods found their way to the enemy. It would not take long to explode this fallacy. England may prefer cash which is greatly needed to excess rubber which is not needed, but England's one overwhelming consideration today is the destruction of the enemy, and anything that would in the least postpone that devoutly wished for consummation would get short shrift.

But entirely apart from the question whether the British government if provoked too far would clamp on the embargo again, is this question—Will the American rubber trade, which has entered into an agreement that its product shall not find its way to the enemies of Great Britain, keep the faith?

AERIAL PREPAREDNESS.

MR. ORVILLE WRIGHT, who, by the general consensus of opinion, will be accorded a place on the civilian board of inventors which is to assist the army and navy in our national defence, states that for proper protection in times of peace, not to mention requirements in times of war, our military equipment should include at least 2,000 aeroplanes, which would be very nearly 2,000 more than we have at present.

The utilization of the aeroplane has been one of the most interesting developments of the present war. It is now generally recognized that without these aerial scouts a modern army would be absolutely helpless. It would be like a blind man in a fistic encounter; it would never know where the enemy was going to strike. The aeroplane is the army's eye. It locates the enemy, it perceives whither he is moving and detects his intentions. Because of its far-reaching vision it is no longer possible to strike an army, so protected, unawares.

The introduction of the aeroplane in large numbers in military operations is a matter of genuine importance to the rubber industry, for rubber enters into the construction of this sort of craft in many ways, as was set forth in detail in an article on this subject which appeared in the April issue of this journal. To be sure, if the requirements of the United States army and navy were fully met by the construction of 2,000 of these flying machines, the demand on the rubber industry would hardly be noticeable. But in view of another statement made by Mr. Wright, namely, that the average life of an aeroplane in active service is only seven hours, it will be seen that the construction of the initial number of necessary flyers is only the beginning, and that once engaged in active operations, they would require continuous replacing. This would mean aeroplane construction on a scale that would certainly open up a considerable field for the further consumption of rubber.

ONE REASON WE IMPORT GERMAN RUBBER GOODS.

THE rubber manufacturers of the United States produce a much larger yearly output than those of any other country. In fact they equal the product of all foreign manufacturers combined. It is natural to assume, operating on this great scale, that their factory equipment must be superior to that of plants in other parts of the world, but, to keep well within the bounds of moderation, it is certainly safe to say that American rubber factory equipment is quite as good as that to be found anywhere.

If this mechanical equality—not to claim any superiority—were not sufficient to insure a home market for American manufactures, there is a duty on the imports of rubber goods ranging from 10 to 35 per cent. And yet, in the face of this, Germany manages, or did up to the outbreak of the war, to market a considerable quantity of rubber goods in this country. The question, therefore, naturally arises how it is, in view of our manufacturing capacity and the double handicap of the expense of transportation and the payment of duties, that Germany can compete in the American market. The answer will be found in some tabulations that appear on another page in this issue, taken from a report recently issued by the German Factory Workers Union, which in 1913 made a thorough investigation of the conditions under which German rubber workers are employed. This tabulation shows in great detail the wages earned in the different departments of the German rubber factories.

The investigation covered 86 plants and a general average was made of the lowest wages and also of the highest wages paid for each sort of work. Omitting all mention of the lowest wages, we find that the average highest wages for a week consisting of 55½ hours in these German rubber plants run as follows: For washers, \$5.64 a week; for mixers, \$6.58; for makers of inner tubes, \$5.66; for footwear makers, \$6.07. The comb polishers seem to fare the worst, the average maximum wages for this work being \$4.86, while makers of hard rubber insulation receive \$8.33; the general average of the best paid skilled workmen in these factories being about \$6.50. In the German mills the women practically do every sort of work that is done by the men—they are employed as mixers, in the making of hose, inner tubes, casings and insulated goods and also in the preparation of crude materials. But citing only the one class of work which is quite universally done by women in this country—the making of light rubber footwear—we find in the German mills the best paid women shoemakers get \$3.33 a week; which is about the average wages for women in the various manufacturing departments.

Comparing American wages for the sort of work referred to above, we find that washers get \$14 a week; mixers, about \$18 a week; boot makers and tire makers engaged on piece work, from \$18 to \$30, or, say, an average of \$22 a week; while the women shoemakers get from \$10 to \$12 a week.

If we were to make parallel columns of these wage scales, we should find that the workers in American rubber mills get about three and a half times the wages paid for the same class of work in Germany. It is not particularly difficult to see, therefore, how it is that, notwithstanding the double disadvantage of transportation costs and imposts, Germany has been able to sell some of her rubber manufactures in the American market.

WILL THERE BE ANY RUBBER MEN?

SECRETARY DANIELS has applied to the officers of eight scientific societies asking each of them to select two representatives for membership in the Bureau of Invention which is to co-operate with his department. The societies appealed to comprise organizations of electrical, mining, civil and mechanical engineers, chemists, aeronauts, inventors and a mathematical society. All of these men of science, including the miners and the mathematicians, will undoubtedly be helpful in devising ways to do up the enemy; but where are the rubber men?

The really clever work in naval operations during the present European trouble has been done by the submarines, and the only device for keeping an eye on the submarine is the flying machine, and neither one of these would be worth its salt without rubber. Without rubber the submarine would be so full of leaks that it would go to the bottom like a stone, and without rubber the aviator, though he might succeed in getting up, would certainly be afraid of coming down.

But Secretary Daniels is only feeling his way. By the time his advisory board is completed it will doubtless include a couple of rubber representatives to see that the ideas of the others will hold water.

A FAMOUS CHANCE FOR A RUBBER DETECTIVE.

BRAZIL is making an earnest and anxious search for someone who knows which is which in rubber. When he is found he will be assured a warm welcome and doubtless substantial remuneration. As is known to every student of South American affairs, the Brazilian government has sought for a number of years to devise measures to protect the rubber of the Amazon from the ever-increasing encroachments of plantation rubber, which, it will be remembered, had its origin in the seeds surreptitiously abstracted by the impious Mr. Wickham.

In furtherance of its campaign for encouraging the use of Amazon rubber, the federal legislature of Brazil formulated last year certain new tariff regulations for 1915 which, as far as home consumption was concerned, would place articles manufactured from Eastern rubber at a great disadvantage as compared with articles made from rubber exported from Manaus and Para. For instance, pneumatic tires and inner tubes for automobiles and other vehicles, if made from Brazilian fine Para, were to be admitted, under this new schedule, with an ad valorem duty of only 5 per cent., but if made of any other rubber the duty was to be ten times as much, or 50 per cent.; while in the case of solid tires and various other articles manufactured from rubber, those made from Brazilian fine Para were to pay only 100 reis per kilo., while those made from rubber of foreign origin were to pay one hundred times as much, or 10 milreis per kilo.

Here was a differential tariff which would seem to provide adequate protection for the rubber gathered in the Amazonian forests. But when the new tariff went into effect a great difficulty was immediately encountered. No one connected with the Brazilian customs seemed able by any of the five senses customarily accredited to

man to detect whether the hot water bottle, tire or raincoat under consideration contained the smoked latex from the Amazon jungles or the smoked latex from the Eastern plantations; nor were the laboratory facilities of Para equal to the work of discovering which was which. Consequently the new tariff was held in abeyance, while representatives of the government went forth into the scientific centers of the world to find someone who could sit at the Brazilian seat of customs and tell unerringly where the rubber came from that entered into the article offered for import.

If, as is quite probable, this problem is too much for the chemists, will not the clairvoyants kindly come forward?

THE TIRE ADJUSTER DOOMED?

A MOST interesting and necessary personality is the Tire Adjuster. Polite, persuasive, alert, he soothes the ruffled, praises the fair-minded and blandly rebukes the prevaricator. He saves money for his company and makes friends of complainers. That so picturesque an individual should have his profession threatened with extinction is a pity. Yet that possibility is in sight. One of the great tire concerns is possessed of a detector which, if it proves practical, will supersede all expert estimating of mileage. It is a simple little appliance, buried in the bead, that unerringly takes the count for every rotation of the tire. The idea is novel; indeed is excellent. It is also suggestive of wider application. Why not adapt it to footwear? Why not conceal it, for example, in rubber boots, and put an end to false claims as to wear? Would it not be of value in rubber belts, secretly registering the day's work? Analogous to it would be a tiny instrument to record the amount of water passed through each length of fire hose; a self-registering thermometer in hot water bottles proving the use of boiling water, and so on.

Whether or not such mechanisms come into use and displace tire and other adjusters, certain it is that guess work in rubber is swiftly becoming a thing of the past.

IN THE PASSING OF THE HON. WILLIAM M. IVINS, THE rubber trade loses one who in years past was one of its most brilliant and forceful figures. His connection with William R. Grace, his association with the founders of the United States Rubber Co., his presidency of the General Rubber Co., and his active interest in the trade during its formative period, make him one of the founders of the industry. He knew the markets of Europe and of South America better than most, and his vacation trips were to the tropical rubber centers rather than over the beaten tracks of the tourists. A brilliant and convincing speaker, a fascinating conversationalist, the possessor of a great store of knowledge, the trade and the country lose a unique and commanding personality.

The Story of Gutta Percha.

EARLY HISTORY.

It is to the Dutch that we owe the first as well as the last word in the history of gutta percha. The last word is the history of the firm establishment in Java of the scientific cultivation and utilization of the plant. The first was when the Dutchman, John Tradescant, brought to England the first specimen of gutta percha which attracted the intelligent curiosity of white men. The Tradescants, father and son, the former sometime gardener to Charles I of England, were botanists and travelers, alert and wide-awake men, greatly in advance of the age in which they lived. They established a museum of "rarities" at South Lambeth, "near London," a heterogeneous collection of curious objects from many lands. In the catalogue of this "Museum Tradescantium" there occurs an entry which for two hundred years attracted little attention but which now holds a surpassing interest for all students of the industrial side of the history of civilization. This notes that "The pliable mazer wood, being warmed, will work in any shape." That is all. No attention was paid to it and, in spite of statements to the contrary, the specimen was lost and is no longer to be found among the remains of the "Museum Tradescantium," now housed at Oxford.

But though nothing further came from the bringing to Europe of this earliest known specimen of gutta percha, the history of that necessity of civilization cannot be written without reference to the Tradescants. They knew that the strange pliable wood was worth attention. But that was an age of politics and religion, and people had no taste for such minor matters as science and invention. Modern encyclopedias and biographical dictionaries slight the Tradescants, who, however, have been immortalized by having had named for them the genus *Tradescantia*, by an authority no less than the great Linnaeus himself.

The fact that it was called wood is not strange, for gutta percha in its crude form shows a distinct fibrous appearance. The wood "Mazer" comes from an old Teutonic name for the maple and was given to drinking cups originally made from the wood of that tree. They were shaped like the classic "crater," a flaring cup with a foot, thereby distinguished from the "tumblers," which would not stand on the table, thus placing upon the guest the necessity of drinking all the wine poured out by the hospitable host.

From 1656—in the time of Cromwell—one hundred and fifty-six years passed before the strange substance again attracted the attention of civilized men. Then Dr. William Montgomerie, British medical resident at the newly founded town of Singapore, observed whips of a strange material in the hands of some of the natives. They told him that it was "gutta percha." Any person who has had experience in getting information from "natives" anywhere can imagine the Scotch physician's questions and the answers he received. What was gutta percha? Why, it was just gutta percha, that was all. What was it made of? What a question! The

whips were made of gutta percha, but gutta percha was gutta percha and that was all there was to it. Where did they get it? Why, they bought it of a man who had gutta percha to sell. Where did that man get it? Why he bought it of another man. That was the only way gutta percha was to be had—to buy it of somebody who had it to sell. It was all very simple and only a muddle-headed white man could ask such foolish questions as to what it was, when anybody could plainly see that it was gutta percha; and ask where it came from, when it could be had of any trader who kept it for sale.

After twenty years, however, Dr. Montgomerie had found

that it was made from the coagulated milky juice of a tree and was able to obtain several specimens of the material. On the first of March, 1843, he wrote from Singapore to the Medical Board at Calcutta, describing the physical properties of the substance and suggesting its use in the manufacture of certain surgical instruments. With this letter he sent some instruments he had manufactured with his own hands, also the handle of a parang, the East-Indian congener of the Spanish American machete, and used by the natives for all manner of purposes, from cutting down trees to slicing disagreeable neighbors. He was unable to obtain any parts of the plant to aid in its botanical identification. The reason is interesting. The locality where the trees were found, seven miles from Singapore, was so infested with tigers that nobody cared for the task of collecting the desired specimens. Dr. Montgomerie's letter was printed in the "Journal of the Agricultural and Horticultural Society of India" and is the first published article which clearly and definitely gave to the world a knowledge of gutta percha.

It is an unfortunate fact that through the whole history of the world there has been scarcely an important invention, discovery or epoch-making fact of any sort which has not been the occasion for controversy of a peculiarly bitter kind. The introduction of gutta percha to the arts of civilization is not an exception and the question of priority cannot be shirked.

In the spring of 1843 Dr. Jose D'Almeida, a British subject in spite of his Spanish name, brought to England a riding whip made of gutta percha and also a piece of the crude material. These were presented to the Royal Asiatic Society, the secretary of which acknowledged their receipt in a letter dated April 8, 1843. In the summer of the same year Mr. Henry Gouger, on behalf of his brother-in-law, Dr. Montgomerie, presented to the Society of Arts a bottle of the latex of the gutta percha tree, together with specimens of the gum in various early stages of manufacture. The specimens received by the Royal Asiatic Society from Dr. D'Almeida attracted no attention. That sent by Dr. Montgomerie to the Society of Arts was referred to a committee which, at a later date, January 23, 1845, reported that "this substance appears to be a very valuable article and might be employed with advantage in many of the arts and manufactures of the country."

Further experiments made under the auspices of the So-



JOHN TRADESCANT, SR.

ciety of Arts, including the making of belting and water-pipe, confirmed this opinion; and on June 2, 1845, the society justly awarded to Dr. Montgomerie a gold medal for his discovery and suggestion as to the uses of gutta percha. It is here that controversy begins. The society which received and gave to the world the knowledge of gutta percha has been criticized for awarding the honor to the man who furnished it with the information and material, instead of to another man who sent the substance merely as a curiosity to another society, which received it in the spirit in which it was sent. So far as is known, Dr. Montgomerie was the first white man who made use of gutta percha as a material for manufacture; the first to suggest to others its use; the first to give to the world a published account of its origin and its actual and possible utility; the one who indisputably brought it to the attention of the men who first engaged in the commercial production of its manufactures. Had Dr. D'Almeida sent his specimens to the Society of Arts and Dr. Montgomerie his to the Royal Asiatic Society, the medal might have been differently awarded, but the fact would have remained that Dr. Montgomerie was still the first to utilize and publish the discovery. In any event, however, the seed sown by Dr. D'Almeida fell on absolutely sterile soil while that of Dr. Montgomerie took root and grew. The man who bets on the wrong horse is entitled to sympathy, but not to the stakes. And aside from the fact that the specimens of Dr. D'Almeida were exactly in a class with those of the Tradescants, unquestionable priority must be awarded to Dr. Montgomerie and all according honor for having introduced gutta percha to the world of science and the useful arts.

The etymology of gutta percha is obscure and probably will remain so to the end of time. That it is from the Malay language is undoubted, also that "gutta" means the gummy exudation from any tree. But here the trouble begins. Nobody has agreed as to what "percha" means. Every explanation which has been hopefully brought forward has fallen to the ground when examined by men with a thorough knowledge of the Malay language. As to "gutta taban" and "taban meerah," it appears that "taban" does not mean simply "tree," but a gutta-percha producing tree. In Sumatra the equivalent term is "balam," while in the Philippines it is "nato." "Meerah," it is on all hands agreed, means "red," so that "gutta taban meerah" is "gutta" from the red "taban." According to Mr. Curtis, sometime superintendent of the Penang Botanic Gardens, the natives give the name "taban percha" to *Palauquium maingazi*, a tree similar in appearance to *Palauquium gutta*, but furnishing a quite worthless gum. This might indicate that the Malay informants of Dr. Montgomerie were themselves misled. One native may have pointed out a tree and said that this was the tree which furnished the handle of his parang. Another, knowing or believing that this was a "percha" tree, may have declared that the substance was "gutta percha." But whatever the mistakes or the accuracy of these little brown brothers of seventy years ago, the name gutta percha will endure as long as the world stands. Our language is full of names once misnomers, but they have a meaning now and are not going to be changed. In regard to the spelling "gettah," occasionally affected, it need only be pointed out that spelling the words of barbarous people is

always a difficult matter. Elisions are common and their vowel pronunciations are varied and obscure, more often than otherwise merely a neutral sound which might represent the short form of any of the five vowels. The same is true of uneducated or careless speakers in every country. In the case of the Malays and others using the Arabic alphabet, which represents only consonant sounds, the possession of a written language does not help to fix the speech, so far as vowel sounds are concerned.

The "taban meerah" or red taban, *Palauquium gutta*, gets its name almost certainly from the color of the bark, a warm, red brown which is constantly maintained by the outer bark falling away in small chips. The under side of the leaves, the only side seen by a person walking under the tree, has a golden or coppery red sheen. The young twigs and even the fruit are covered with reddish brown hairs. The inner bark is decidedly red, the wood is reddish brown and the gutta

is reddish. No wonder the natives called it taban "meerah." The flowers are in sixes—six sepals, six divisions of the corolla, twelve stamens in two series of six, and six pistils. Of these, all the seeds but one or two are abortive, the result being a drupe-like fruit as big as a good-sized plum and with a sweet and eatable pulp which, however, according to Mr. Wray, "has a disagreeable flavor of gutta percha." This flavor does not bother the native fruit-bats, which are very fond of the fruit. These bats are very pugnacious and egoistic individuals and one of them cannot bear to see another eating the fruit he would like to eat himself. So, when one has secured a fruit and does not wish his coat punctured by one of his brothers, he detaches it from the tree and flies to another tree of a different species standing anywhere from a few yards to a quarter of a mile away. There he eats the pulp and discards the seeds which are too large and hard for his purposes. It is this process which has



JOHN TRADESCANT, JR.

scattered the trees throughout the forests of the districts to which they are native. The seeds are as large as almond kernels and contain a valuable oil which is solid up to a temperature of 90 degrees Fahr., and is used by the natives for culinary purposes. Of course the seeds of the best species are far more valuable for planting than for butter purposes just now, but when, in the distant but certain future, the supply of plantation gutta percha approximates the commercial demands, the oil from the seeds is likely to prove a valuable by-product.

Of course it is its peculiar and wonderful product which gives the tree its interest above all others of its family. Fruits, oils, timbers, are all needed in our economy, but without gutta percha there would have been no submarine cables and many an important scientific experiment never would have been made. While everybody knows that gutta percha comes from the "juice," there are still too many who think that it is the sap of a tree. Just how a thick and viscous fluid could perform the functions of a sap has certainly never occurred to them. Of course, the exudation from which gutta percha is derived is a latex or milk, which is not, as often said, the English translation of the Latin-derived name, meaning simply juice. Though it is true that the latex of most plants is white like milk, a few have yellow or even red latex. It is said that in all cases it is colorless while in the latex cells,

but becomes turbid on the instant it is exposed to the air. It is found in many species and families of plants, the poppy, milkweed and spurge families, with the strap-flowered section of the Composite, being well-known examples.

COMMERCIAL BEGINNINGS.

A short time before the award of the gold medal to Dr. Montgomerie, Mr. H. W. Jewsbury, who learned of the investigations of the new substance, determined to send an order to Singapore for a quantity of gutta percha. Before this order was sent he chanced upon a cask containing forty-five lumps of gutta percha, weighing about two hundred pounds. It had been sent on speculation and had lain at the docks for many months without a purchaser. It was bought for ten pence (twenty cents) a pound, this being the first commercial transaction in gutta percha in civilized lands. This was on the 30th day of April, 1845. In May of the same year the predetermined order for five hundred pounds was sent to Singapore. By the next mail went an order for ten thousand pounds and next month an order for a hundred thousand pounds. Gutta percha, in the slang of a few years past, had caught on and was soon scrambling toward a front seat in the car of commercial progress. At first the experimenters seemed, like the Tradescants, to regard it simply as a "plyable wood" which, being heated, could be molded into any shape. Then came the wild determination that it should take the place of india rubber, whether it would or no. It was made into clothing, cups, canes, plates, boxes and a thousand other things which could as well have been made of some other and less expensive material. Some other early uses, for which it was well adapted, were manufactures of water-pipes, acid tanks and surgical articles.

Gutta percha had certain resemblances, both real and illusory, to caoutchouc and it was, at the time, very much cheaper. So whatever could be done with rubber was undertaken with gutta percha. This was attempted the more desperately because the Good-year patents shut out all but holders under their right from the use of india rubber in its only practicable, that is, its vulcanized form. Therefore they insisted that if gutta percha were not elastic and durable in air and sunlight it ought to be and must be. They needed the money. So they went ahead with their vulcanized and unvulcanized gutta percha, making articles of commerce if not of utility, and left behind them a collection of advertisements which make curious reading sixty years later. One American firm made a considerable success and produced goods of excellent quality, using several closely kept factory secrets—the greatest of which was that the material used was not gutta percha, but rubber.

But it was at about this time that the stone which the builders rejected became the corner of the temple. The dawn of the age of electricity was at hand and gutta percha was indispensable for its most important development—that by which the ocean-sundered continents were brought within hailing distance of each other.

The question of who first discovered the electrical qualities of gutta percha is one of interest, but one which has not been answered quite to the satisfaction of all inquirers. Professor James Collies, who has given a vast amount of time to the

history of gutta percha and who is not influenced by family or associations in consideration of the problem, says flatly (Encyclopedia Britannica) that the electrical qualities of gutta percha were first noticed by Faraday. It has been pointed out that others were undoubtedly in possession of the knowledge before Faraday's publication of the fact in 1848, but it has not been shown that any one else published the discovery before that date or that anyone knew the properties earlier than did Faraday. The claim that anybody anticipated the discoverer of induction and diamagnetism in gaining an understanding of the properties of a substance which had attracted the lively scientific interest of all the world at that time, is one that calls for a weighing of probabilities and a production of proofs. Of course the name of Faraday stands like a mountain peak in the field of electric discovery and the taking away of a single stone would not alter its place above the skyline of history. As to who first made the discovery under discussion, is not so much a question of justice to Faraday as of justice to gutta percha.

The question is less important in view of the fact that the discovery was inevitable and the application within a very short time. The first to make practical application of gutta percha for the insulation of cables was Werner Siemens, a Prussian infantry officer, who was later known as von Siemens, having, after the German fashion, been made "high and well born" for his successes in the field we are considering. He was a brother of Sir William Siemens, a naturalized British subject, an eminent scientist and inventor and a close friend of Faraday. It was from Sir William that Werner von Siemens received a sample of the original lot of gutta percha sent by Montgomerie to the Society of Arts.

In 1847 von Siemens began the manufacture of what was probably the first gutta percha-covered subterranean cable and also invented a

machine for covering wire with that substance. At that time there were more than fourteen hundred miles of underground cable in Germany, insulated with other materials. But the insulation was in every case either defective or subject to quick deterioration and the use of gutta percha was of far-reaching importance.

The submarine cable had another and separate origin. As the first land-telegraph line was American, so was the first gutta percha covered subaqueous line. This was made about the middle of September, 1847, by Dr. John J. Craven, of Newark, New Jersey, who, with the assistance of his wife, covered with gutta percha a piece of wire about fifteen feet long and sunk it beneath the waters of Bound Creek, a narrow salt-water inlet crossing the present roadway of the Pennsylvania Railroad between Newark and Elizabeth, New Jersey. The ends of this little pioneer submarine were then connected with the land telegraph line between New York and Philadelphia, and messages were flashed under the briny waters of Bound Creek which, if not as deep, were quite as wet as those of the Atlantic Ocean. This test led directly to the laying of a cable, under the Passaic River at Newark by the Magneto Telegraph Co. This also was made by Dr. Craven. It likewise proving a success, a more important venture followed, the same company laying a cable, June 15, 1848, across the North River, landing at Cortlandt street. This cable, a mile long, settled the question of the commercial practicability



DR. WILLIAM MONTGOMERIE.

of submarine cables and only the problems connected with the great lengths of the ocean cables and the vast depths they must be laid remained for solution.

In the meantime, in Europe, gutta percha was falling into disrepute as an insulating material and it remained for the Americans to show that the useful gum had been sinned against rather than sinning. It is a curious illustration of the empirical methods in vogue at that time—the utterly irrational manner in which these cables were made by men who were at the same time wise enough to make them at all. They knew that india rubber had been "vulcanized" by heating it with sulphur, thus rendering it immensely more valuable. They knew, possibly, that "brimstone and treacle" was part of the *materia medica* of Dotheboy's Hall. At any rate, with this or other information at hand they looked at the defenseless gutta percha in their possession and decided that its constitution would be improved by a dose of sulphur. So they remorselessly went ahead with their brimstone treatment, feeling certain that if gutta percha were excellent, surely vulcanized gutta percha would be super-excellent. But the result was not just as expected. The electric current promptly set up a chemical union between the sulphur of the sheath and the copper of the wire, turning both wire and insulator into sulphate of copper, a substance which, however excellent for spraying cucumbers, is not well adapted for the transmission of electricity. The cables turned into a pale blue streak and the misguided vulcanizers recorded their opinion of gutta percha in speeches which might have answered the same description.

The North River cable was made by Stephen Armstrong, of Brooklyn, and consisted of a No. 9—some say No. 12—iron wire, enclosed in one-half inch of gutta percha insulation.

Mr. Armstrong was not only the first cable-maker but the first importer and manufacturer, in America, of gutta percha on a commercial scale. He seems to have been one of the first, if not the very first, of the manufacturers to question the necessity or advisability of administering big medicine to a patient as healthy as pure gutta percha. He showed Vulcan the front door of his Brooklyn factory, but the lame god lingered for many years in the establishments of many manufacturers, particularly on the continent of Europe, freely distributing the yellow gift of Aetna or Popocatepetl and spoiling everything he could, until the expiry of the Goodyear patents placed rubber at his disposal and gave him useful work to do. Mr. Armstrong, seeing the vast possibilities of gutta percha insulation, proposed, in 1848, in the New York "Journal of Commerce," that an ocean cable be laid between Europe and America.

In 1851 the first important submarine cable was successfully laid between Dover, England, and Calais, France. This was accomplished by the Brett Brothers, who, in 1846, had applied to the French government for a concession to lay such a line. On August 28, 1850, a single gutta percha-covered wire, like that of Dr. Craven, was laid just in time to save their concession. The slight insulation led the makers to expect almost immediate failure but, meantime, messages had been exchanged and time was

permitted for repairs. It was afterward learned that the expected early failure was accelerated by some French fishermen who gapped and brought up the wire and, wondering what it could be, cut out a liberal section to carry back to France as a souvenir. The second cable was opened to general business November 13, 1851, and continued in service for many years. This was the prototype of all later submarine cables having a core of copper wires, insulated with gutta percha, surrounded by tarred hemp and protected by spirally wound galvanized iron wires. It is a curious illustration of the survival of early errors that nineteen out of every twenty persons know what a cross section of the ocean cable looks like and eighteen of the nineteen think that a separate message passes over each of the protecting wires. Two years after this first cable Ireland was successfully annexed to Europe by submarine cable and a new line was laid from Ramsgate, England, to Ostend, Belgium. This also was laid by

the Bretts. It not only gave the British Isles connection with the continent of Europe, but had that connection free from control by Napoleon the Little, who had recently made himself Emperor of the French. After this, rapid progress was made in connecting the islands of Europe and making short cuts across waters which before had been expensively skirted by land lines. But America was still shut off from the rest of the civilized world.

The question of who first thought of a transatlantic cable is one which will not be answered. The idea is one which would occur to every intelligent mind as soon as the electric telegraph had proved a success. And, as always happens, the first suggestions were scoffed at as the talk of idle dreamers by the "hard headed" business men and scientists, whose boasted hardness of head is often much of the quality of cast iron. But, as is also



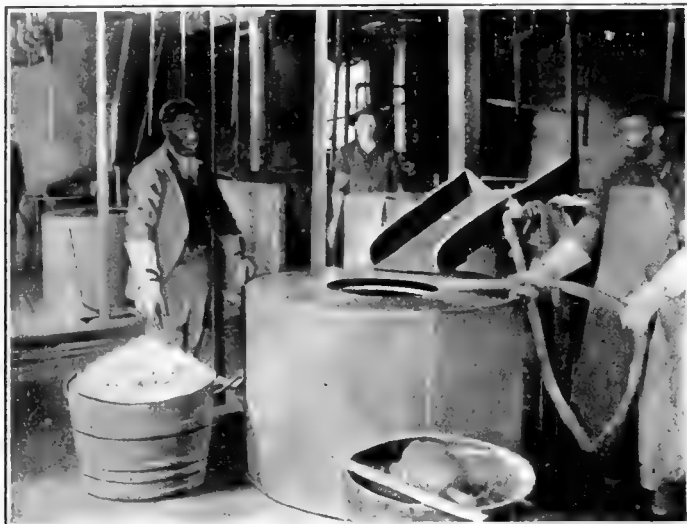
GATHERING GUTTA PERCHA.
[From an Old Print.]

always the case, the dreamers went on dreaming until their dreams were translated into reality. One of the earliest of these dreamers and the first to make efforts leading to practical results was Cyrus W. Field, a member of the very remarkable family of brothers, which included David Dudley Field, who has been called one of the three code-makers of the world, the other two being Justinian and Napoleon. In 1854 Mr. Field secured a charter for a company, with the purpose of laying a cable between the two continents, via Ireland and Newfoundland. Among the names of those associated with the enterprise were those of Marshall O. Roberts, Peter Cooper, David Dudley Field and Professor F. B. Morse. Among the English subscribers, one of the earliest and largest was John W. Brett, the pioneer of ocean telegraphy. In England the chief promoter was Sir Charles Bright, who was knighted for his services.

Mr. Field bore up amid every discouragement and made fifty trips across the Atlantic before winning final success. In 1857 the cable ship started, but the cable broke and was lost. Next year one was successfully landed, and on August 16, 1858, cable messages of congratulation were exchanged between Queen Victoria and President Buchanan. This line worked for a few weeks and then became useless. Finally, on July 27, 1866, permanent connection was made between the two continents.

India Rubber in the Making of Explosives.

THE whole art of modern war is the science of explosives. Not only is all Europe engaged in the manufacture of explosive material, but the powder plants in the United States are working night and day to supply these essentials to the belligerents. There is no explosive that is made from rubber.



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WRINGER IN THE NITRATING HOUSE.

but it is safe to say that without the assistance of rubber no explosive could be manufactured.

Somewhere on the Atlantic coast, back in 1898—the censor might object if we mentioned the port—the military authorities decided to mine the harbor approaches lest the Spanish cruisers dash in and lay the city under tribute. Accordingly, the soldiers of the regular army at the post were set busy charging the submarine mines with dynamite. It was not very long before these men were too sick to discharge their duties, and the preparation of the underwater defense of that port came to a standstill. Now the trouble was that the dynamite—which is made up of an infusorial earth saturated with nitroglycerine—was old and had begun to exude its explosive content. It was hot weather, the work was toilsome, and the men perspired freely, and they also labored with bare hands. Nitroglycerine is both a poison and a powerful tonic. As the soldiers worked they wiped their reeking brows and faces with their hands, and thus into their systems entered the stimulating and then the toxic exudation from the explosive. It was not until some volunteers, forming part of a hastily organized body of military engineers, were assigned to the planting of the mines that the cause of the trouble was disclosed. These men were familiar with dynamite through blasting operations. When they tackled the job—and they did so quickly and understandingly—every one of them put on rubber gloves, and there was no more trouble.

If you could look inside a plant where nitroglycerine and dynamite are made you would see how careful the operatives are to wear rubber gloves, reaching well to the elbow, and also rubber boots, in order that the toxic explosive glycerine shall not work its way into the body through the hands and feet. There are thousands of men now engaged in the preparation of these military agents, and rubber is indispensable as a physical safeguard. The same need applies in the manufacture of smokeless powder; and as this department of ordnance supplies is probably one of the most interesting, we shall describe how this most modern of propellents is made at the naval powder factory at

Indian Head, Maryland. We purposely choose this establishment because it typifies the highest state of the art and is intimately identified with the nation's foremost line of defense.

The base of our smokeless powder is cotton waste. The cotton filament is really a tiny tubular structure composed of an indestructible substance called cellulose, which, when sufficiently saturated with nitric acid, undergoes a chemical metamorphosis; in short, it then becomes an explosive, and is technically called nitrocellulose or guncotton. Nitrogen has the notable property of carrying a very large measure of oxygen as well as possessing inherent molecular energy of a pronounced order. The oxygen makes for more perfect combustion, hence contributes to smokelessness, while the resultant heat and energy of inflammation give us the desired properties to be found in the high explosives now employed both in military and industrial work of a variety of sorts.

Down at Indian Head, the cotton waste is run through a stripping machine that combs it out; and then it is washed to remove all traces of grease. For this purpose, the cotton is cleansed in an alkaline bath, and here we see the workmen busy at their task in rubber boots. With this operation finished, the cotton is then subjected to a drying process and is stored in chambers heated to a temperature of 212 degrees, Fahrenheit.

In the drying rooms, after a sufficient exposure, the cotton is packed in metal cylinders made airtight by having their covers seat down upon gaskets of rubber. This is to prevent the stuff from reabsorbing moisture from the free atmosphere. Packed in this fashion, the cotton is ready to be carried to the nitrating house, where it is transformed from a harmless material into a high explosive. The primary purpose of the drying is to stimu-



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MECHANICAL KNEADER BY WHICH ETHER-ALCOHOL SOLVENT IS WORKED INTO GUNCOTTON.

late the absorption of the metamorphosing acid, and it is during this permeating process that we realize that the cotton has not been freed of all of its moisture by its previous heating.

The effect of the nitric acid is to liberate the stubborn moisture,

and this produces enough water in the course of a short while to dilute the nitric acid. The thing desired is to have the acid in its full strength attack the cellulose and thereby intensify the vigor of the explosive so formed. A weakened nitration would be a drawback. The clever chemist has overcome the difficulty in this way: sulphuric acid is mixed with the nitric acid because sulphuric acid has a strong affinity for water. What follows? Why, the sulphuric acid takes up the increasing moisture and this



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NITRATED COTTON BEING DUMPED INTO STEAMING VATS.

leaves the nitric acid unimpaired and capable of doing its full work upon the cotton.

The nitrating house at Indian Head looks inside not unlike a section of a big steam laundry, and, indeed, kindred facilities are actually employed there. The cotton in being nitrated is put in centrifugal wringers much like those in which clothes are washed wholesale. When the nitration has reached the proper point, and the artisan knows this, the cotton is roughly freed of the bulk of the acid by the mechanical wringer. The men at the machines are apparently indifferent to the intensely acrid atmosphere which bites the unaccustomed throat and nasal passages. But just the same, these workers have to be very careful, and here is where rubber protects them. In addition to long rubber gloves and rubber boots they wear aprons of the same sort which cover the front of the body, the hips and the legs well down below the tops of the boots.

When the cotton has soaked long enough in the acid it shows signs of incipient combustion by giving off a dense brownish smoke. At once the material is dumped into vats, where water is turned upon it by means of rubber hose. After being properly "drowned" the cotton is taken out and partly freed of its liquid content by means of other mechanical wringers. The stuff is now guncotton or pyro-cellulose. What follows is something in the nature of a paradox. Just as determined as the experts were to thoroughly saturate the cotton with nitric acid up to this stage, they are now bent upon removing every trace of the transforming chemical. Indeed, the stability of the explosive subsequently and its value as a propellant depend upon the thoroughness with which the succeeding operations are carried out.

The "pyro"—to adopt the abridged term used at the factory—is carried from the nitrating house in open tubs placed upon flat cars, and transported to great steaming vats. Into these it is dumped, and for the better part of 48 hours it is boiled continuously, for the purpose of extracting the biggest part of the free acid still clinging to the cotton filaments. After two

days of boiling, the "pyro" is removed from the vats and carried to the pulping house.

In the pulping house the "pyro" is pulped and poached just as are the materials used in paper making; and after anywhere from 20 to 30 hours of this pulping—the time depending upon the acid index of the liquid—it is finally freed of the last trace of the transforming chemical. Strange as it may seem, the boiling and pulping processes do not vitiate the work of the initial nitration. The chemical change worked in the cotton is a permanent one, and the subsequent operations are intended to remove only the unabsorbed acid. The pulping house is a wet place, and here, too, the workers wear rubber boots and rubber aprons, and, occasionally, rubber gloves. Of course rubber hose is used extensively.

Immediately after coming out of the pulping vats or tanks, the problem is to get rid of as much of the water as possible. The slimy material is carried upon a belt of blanketing to a "wet machine," and from the rollers of this apparatus it issues in flakes containing in the neighborhood of 40 per cent. of moisture. This must be got rid of, and to that end the pulped "pyro" journeys to what is known as the dehydrating house. There all but a very limited percentage of moisture is removed by means of successive applications of pressure. But this does not suffice. The last trace of dampness is driven out of the "pyro" by a topping or bath of alcohol.

Again, the powder maker has borrowed from domestic life, for the next machine is a mechanical kneader like those to be found in large steam bakeries. Into this kneader the "pyro," with its percentage of alcohol, is dropped in the form of big white discs. There the right proportion of ether is added, and the mass is worked for 30 minutes. At the end of that time the product is not unlike damp cracker crumbs, and feels much like them. The object of the kneading is to thoroughly mix in the solvent of ether and alcohol. The material has undergone another change by this process, and indeed is chemically smokeless powder. But there are yet a number of things to be done before it is fit to be issued to the naval service and safe for firing in the guns afloat.

Various applications of pressure now follow, and this gives



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PRESSES USED FOR DRIVING OUT WATER AND FORCING IN ALCOHOL.

the "colloid," for such it technically is, its required homogeneity. First, it is pressed into cylindrical cakes weighing about 50 pounds each, and to the inexpert the substance might be mistaken for crude rubber. It has a certain measure of elasticity when dropped, and will rebound. Into the press again the cakes go, coming out through sturdy steel colanders in the

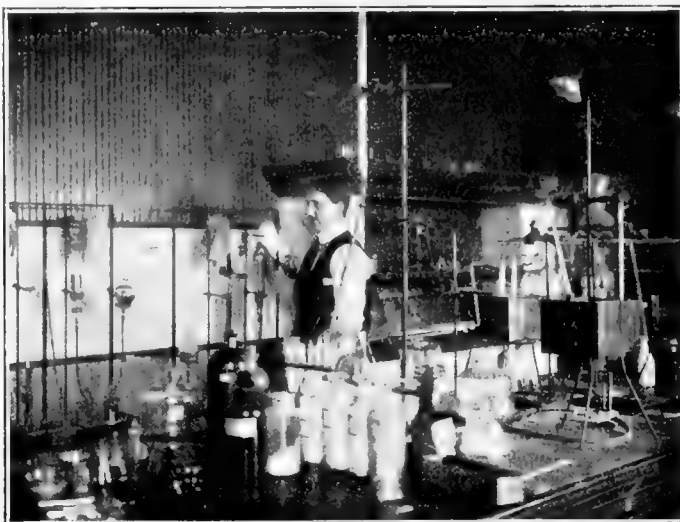
form a writhing cord like soaked macaroni. These cords are put back into the press and squeezed into a single compact cake for the sake of more perfect union, and then the plastic mass is ready for the powder press.

The form of the grains or powder units is one of the technical mysteries of the art, because this regulates the speed with which the grains will burn, and the uniformity with which they will generate their propulsive gases. Depending upon the size of the grain to be made, the "colloid" is subjected to pressure ranging from 4,000 to 6,000 pounds to the square inch, and under the thrust of the powerful piston the stuff is forced through a die that causes it to issue from the press in the shape of an endless stick of pale yellow twisting and moving like a snake. Instead of having one hole, however, through its center, it has that and a concentric group of others perforating the rod from end to end. Every time the rod reaches the end of the table one of the men cuts it off at the press outlet, and then the length is laid alongside its predecessors and straightened. These are next fed to a cutter, which divides the rods into the so-called grains of uniform length. The number of perforations in the rods and the size of the grains are dependent upon the caliber of the gun and the length of the weapon in which they are to be fired. Here are details that should be explained.

If the powder grains were solid it is clear that their outer surfaces would diminish as they burned and, accordingly, less and less gas would be generated. Now the desire is really to maintain a reasonably uniform propulsive impulse up to a certain point in the travel of the projectile after the shot has been set in motion. Therefore, by means of the longitudinal perforations, the burning area is increased internally while the external surface is diminished by the attacking flame. Thus a measure of uniformity is secured, and the power back of the shell does its work until the projectile has acquired its maximum velocity during its journey to the rifle's muzzle. Therefore, the longer the gun the bigger or longer the grain needful.

It is not our purpose to go into the mechanical details of the

We have now seen how harmless cotton waste can be transformed into a smokeless propellant for guns, but a good deal remains to be done before the powder is in a condition for issuance to the naval service. The same can be said of the smokeless powder manufactured by the army at Picatinny, and



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IN THE LABORATORY OF A POWDER PLANT RUBBER HAS MANY USES.

is equally true of the explosive turned out at the numerous plants now commercially engaged in this work.

Finally, the powder is laid in shallow boxes or drawers in the drying house, and these receptacles are maintained at fixed temperatures. Gradually the powder grains darken and harden, and in about six months from the day of forming the stuff is ready to be submitted for ballistic testing, i. e., firing in guns of the proper caliber, and the registering of the pressures developed. Every batch of powder is called a "lot," and no two lots are exactly identical in their performances. In order to secure the desired average of performance, powders of different batches are mixed, and after testing the lot is given its "index." In this way the ordnance experts know just how to apportion the charge so that the propulsive effort of a succession of firings will be substantially alike.

Smokeless powder has revolutionized modern ordnance. Formerly the gun was fashioned to measure its strength with the explosive violence of black powder. The designer knew that he had to use so much of it to get a desired propulsive effect, and this explains the disproportionate bulkiness of the rear part of the older weapons around that portion of the bore in which the propellant developed its maximum effort with amazing suddenness. Today, on the other hand, the designer plans his gun first, using his metal more skilfully, and distributing it in a way that produces graceful tapering contours. Then, having fixed the physical characteristics of his weapon, he proceeds to design his powder grains so that they will burn progressively to harmonize with the construction of the rifle and the ultimate speed to be given the shell at the instant it leaves the muzzle. Smokelessness is an incident, and, as we have said, due to well nigh perfect combustion. The primary purpose of the chemist was to produce a propellant susceptible of the nicest control.

The manufacture of explosives has been given such a tremendous impetus in this country, as well as across the water, during the last six months, that it would be impossible to give the present statistics of this industry with exactness, but they can be approximated with considerable accuracy. At the time of the taking of the last census—in 1910—there were 6,274 workmen employed in the 86 plants in the United States devoted to



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POWDER ISSUING FROM PRESS ON TO CUTTING TABLE.

various presses employed. It is enough for us to know that their piston rods must be held tight, and to that end the best of rubber packing is employed. The same thing is required at pipe joints, and rubber tubing has many applications. This is especially so in plants where the solvent is made and also in the acid house, where the transforming chemical and its sulphurous acid are drawn off into carboys for carriage to the nitrating house. The workmen in the acid house must also be safeguarded from these corrosive chemicals, and rubber gloves, rubber aprons and rubber boots are worn.

the manufacture of explosives. As the greater number of these plants are now working on considerably fuller time than has been the case before in years, and as new plants have recently been established, it would be safe to add about 60 per cent to the number of workmen engaged in this sort of manufacture, as given in the census, so that it would hardly be an exaggeration to say that 10,000 men are now engaged in making explosives in the American powder factories of private ownership. To this number should be added 1,000 or 1,200 men engaged in the government plants, making not far from 12,000 workmen employed in American powder mills of one sort or another. Not all these men are compelled to protect themselves in acid or equipment, but all who are employed in the initial stages of converting cotton into an explosive substance where nitric acid is used are compelled to wear gloves and aprons and boots made of rubber.

And this does not take into account at all the large number of workmen engaged in the factories that produce nitric and sulphuric acid. The necessity they are under of wearing complete rubber protection is even greater. But the ordinary rubber boots, gloves and aprons meant for general service are not immune to the action of strong acids, so that it is necessary to make the rubber equipment worn by workers in acid and powder mills of a special compound with particular reference to the trying conditions under which it is to be used.

THE RUBBER TRADE IN CANADA.

CANADIAN imports and exports of india rubber, gutta percha and manufactures of, for two fiscal years ending March, are officially stated to have been in value as follows:

	IMPORTS FREE.			Total Value.	
	United States.	United Kingdom.	Other Countries.	1915.	1914.
Crude rubber and gutta percha	\$2,041,605	\$814,591	\$747,829	\$3,604,025	\$3,250,080
Reclaimed	775,426	3,672	2,346	781,444	893,595
Waste	83,407	25	519	83,951	131,398
Other	36,165	16	.....	36,181	28,827
Total	\$2,936,603	\$818,304	\$750,694	\$4,505,601	\$4,304,009
Chicle	497,786	381,483	930,525	1,809,794	1,543,433

	IMPORTS DUTIABLE.			Total Value.	
	United States.	United Kingdom.	Other Countries.	1915.	1914.
Belting	\$77,532	\$4,523	.....	\$82,055	\$87,825
Boots and shoes	100,352	26,044	810	126,406	163,247
Clothing and waterproof cloth	51,780	752,473	562	804,815	1,683,365
Hose	88,151	3,140	.....	91,291	142,736
Tires	1,059,275	43,310	108,872	1,204,457	1,412,342
All other	693,438	247,296	31,502	972,236	1,200,777
Total	\$2,069,528	\$1,058,786	\$140,946	\$3,269,260	\$4,144,685
Elastic, including garter elastic	19,983	113,341	87	133,411	148,247

	EXPORTS OF CANADIAN MANUFACTURE.			Total Value.	
	United States.	United Kingdom.	Other Countries.	1915.	1914.
Belting	\$68	\$484	\$1,772	\$2,324	\$5,475
Boots and shoes	9,445	59,032	1,867	69,344	174,800
Waste	76,128	.....	.....	76,128	.....
All other	97,317	1,337	6,788	105,442	105,441
Total	\$38,958	\$181,843	\$17,727	\$238,528	\$285,716

	RE-EXPORTS.			Total Value.	
	United States.	United Kingdom.	Other Countries.	1915.	1914.
Belting	\$554	.....	\$884	\$1,338	\$5,606
Boots and shoes	1,113	.....	80	1,193	2,309
Waste	2,314	.....	.....	2,314	.....
All other	1,290,433	1,874	2,893	1,295,200	4,317,209
Total	\$1,294,414	\$3,878	\$964	\$1,300,056	\$4,325,124

A SUBSTITUTE FOR CHICLE.

A patent has recently been granted to George B. Bradshaw and William H. Bradshaw of Brooklyn, New York, for the composition and the process for making a substance having the properties of gum chicle. Rubbers of various kinds, such as Pontianak and Gutta Siak are desinated and the resin obtained is then cleaned and triturated with dilute soda combined with sugar and is finally blown with superheated steam. [United States patent No. 1,134,073.]

RUBBER STATISTICS FOR THE UNITED STATES.

	IMPORTS OF CRUDE RUBBER BY COUNTRIES.		EXPORTS OF AMERICAN RUBBER GOODS.	
	Value.	Quantity.	Value.	Quantity.
Belgium	Scrap and old	.....
France	Reclaimed	.....
Germany	Belting, hose and packing	.....
Portugal	Boots and shoes	.....
United Kingdom	Boots	.....
Central American States and British Honduras	Shoes	.....
Mexico	Tires	.....
Brazil	For auto. tires	.....
Other South American	All other manufactures of	.....
East Indies	Total	.....
Other countries		
Total		

	IMPORTS OF CRUDE RUBBER BY COUNTRIES.		EXPORTS OF AMERICAN RUBBER GOODS.	
	Value.	Quantity.	Value.	Quantity.
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Total		

A Nicaraguan law promulgated and in effect from March 20, 1915, suspends, until six months after the close of the European war, the export duty on rubber.

The Belgian Maritime Co. of Congo, is now using its steamers for direct trade between the Congo and Hull, England. Rubber, gums and palm oil are among the Congo products recently received in the initial shipment.

What the Rubber Chemists Are Doing.

FRANK GOTTSCHE, of the Mt. Prospect Laboratory, Department of Water Supply, Gas and Electricity, City of New York, publishes in "The Journal of Industrial and Engineering Chemistry," July, 1915, an article on "Specification of Vulcanized Rubber Gum by Volume and Its Determination by a New Solution Method." Detailed methods of test and analysis are given, which contain certain matter original with the author under the headings of "Mineral Fillers," "Foreign Alcoholic Potash Extract," "Vulcanized Rubber Gum by Weight" and "Vulcanized Rubber Gum by Volume." His method for "Free Sulphur" is novel in the application of a well-known method for total sulphur to the free sulphur determination.

ANALYSIS.

FREE SULPHUR.—The dried acetone extract is entirely transferred to a 60 c.c. iron or nickel crucible by acetone, chloroform or benzol, and the solvents evaporated off on the steam bath and 6 grams of potassium carbonate and 4 grams of sodium peroxide are added. Mix, cover, heat at low temperature over asbestos shield to avoid sulphur fumes, until the mixture fuses, then bring to quiet fusion for 15 to 20 minutes. Avoid rapid heating and explosions and rotate the melt while solidifying. When cool put crucible and cover into a casserole with 200 c.c. of water, add 5 to 10 c.c. bromine water and boil melt till dissolved. Settle, decant, filter and wash through thick filter with hot water. Cool, acidify filtrate with dilute hydrochloric acid, make up to 400 c.c. and precipitate boiling with 10 c.c. of 10 per cent. solution of barium chloride.

MINERAL FILLERS.—A one gram sample is extracted by acetone for four hours and the rubber dried in the water oven at 100 degrees Centigrade until the odor of acetone is gone. Transfer the sample to a 100 c.c. beaker, burn the thimble to ash and add it to the beaker. Add 50 c.c. of clear molten salol and heat the beaker on the hot plate at a temperature of not less than 120 degrees, nor more than 150 degrees Centigrade, stirring occasionally until the rubber is apparently dissolved. After settling, transfer the liquid to a 200 c.c. beaker and if the residue in the small beaker contains particles of undissolved rubber more salol is added and solution completed. Stir 2 c.c. of a 1 per cent. solution of soluble cotton in amyl acetate into the warm liquid in the 200 c.c. beaker, cool and add redistilled turpentine until a good "flock" has formed, adding at least 75 c.c. of turpentine with constant stirring. Allow the liquid to stand until the flock settles. The supernatant liquid is decanted and filtered by suction through an alundum crucible placed in a Spencer holder. Wash the flock by decantation with turpentine, filtering the latter, transfer the whole to the crucible, then dissolve carefully in a few c.c. of acetone, and wash the fillers with acetone, being careful not to allow the fillers to cover and clog the sides of the crucible. All beakers and the crucible are to be thoroughly washed with acetone. Dry to constant weight at 105 to 110 degrees Centigrade, cooling in a desiccator. Evaporate all the liquid and washings, transfer to a weighed porcelain dish, burn off the organic matter. Add weight of residue to that of the fillers in the crucible and calculate as "mineral fillers."

FOREIGN ALCOHOLIC POTASH EXTRACT. The dry rubber residue from the acetone extract is extracted with 50 c.c. of alcoholic potash, stoppered, in an air oven kept between 105 and 110 degrees Centigrade for 4 hours. Cool, filter and wash the residue clean with hot absolute alcohol. Precipitate potassium chloride by acidifying filtrate strongly with hydrochloric acid, settle, filter and wash with hot chloroform and evaporate the filtrate on a steam bath till odor of hydrochloric acid just disappears. Take up residue with chloroform, filter and wash with hot chloroform in a small crucible and evaporate to dryness. If the residue is not

oily or greasy to touch, it may be disregarded. If oily or greasy the residue is washed with small portions of 88 degrees Beammé naphtha, filtered through a washed plug of cotton into a small weighed beaker, evaporated and dried in water oven at 95 to 100 degrees Centigrade in 15-minute periods until the weight is constant, or increases. The result is calculated as "foreign alcoholic potash extract."

VULCANIZED RUBBER GUM BY WEIGHT.—Subtract the sum of the percentages of free sulphur, organic acetone extract, mineral fillers and corrected foreign matter from 100 per cent. The balance is the vulcanized rubber gum by weight.

VULCANIZED RUBBER GUM BY VOLUME.—Multiply the percentage by weight of vulcanized rubber gum by the specific gravity. The product is that specified by the term vulcanized rubber gum by volume.

The author in his discussion states that his method for free sulphur is designed to absolutely obviate the influence of organic matter by its complete removal. Concerning estimation of mineral fillers, it is found that salol will dissolve soft rubber in less than an hour and vulcanite in from two to three hours. Owing to the condition of extreme fineness met with in many of the mineral fillers of rubber a coagulant is found necessary to filter them off, even through an alundum crucible. Such a coagulant is found in soluble cotton dissolved in amyl acetate. After discovering in salol a suitable solvent for vulcanized rubber gum, difficulty was experienced in finding a diluting agent which would not reprecipitate the rubber. Ether, chloroform and turpentine were the only satisfactory ones found. Of these only turpentine satisfactorily reprecipitates the soluble cotton used to form a flock suitable for filtration.

Vulcanized rubber gum by weight represents the pure gum (free of resin, ash, moisture and air) plus its combined sulphur. It is this vulcanized rubber gum that gives rubber goods their specific and desirable properties, and it is consequently specified and determined.

Vulcanized rubber gum by volume is more properly related to the physical properties and quality of rubber compounds than is the percentage by weight. This volume conception is necessary to an understanding of rubber mixings. The specific gravity of vulcanized rubber, without mineral fillers, has been shown to be safely taken at unity. No closer method of determining the volume is necessary than to multiply the percentage by weight of vulcanized rubber gum present by the specific gravity of the compound. This volume would be strictly correct if divided by the true specific gravity of the vulcanized rubber gum present, but the factor obtained as specified expresses the true volume close enough for practical needs.

The minimum vulcanized rubber gum by volume that will give a sound article can hardly be less than 55 per cent. if made up of rubber, sulphur and mineral fillers only. Less than this amount needs such materials as resins, oils, waxes or asphaltums to fill the pores between the particles of fillers. As the volume percentage of vulcanized gums decreases in a compound composed of rubber, sulphur and mineral fillers only, the liability of decay by oxidation increases. By specifying a minimum percentage by volume of vulcanized rubber gum the choice of fillers is left entirely to the manufacturer, as it should be. Whether he uses light or heavy fillers is immaterial as long as the volume specified is obtained and the chemical and physical requirements are met. The same result can be obtained by fixing a minimum specific gravity and a minimum percentage, by weight, of vulcanized rubber present, but the kind of fillers would then be limited to a few having a certain density. The method specified permits any manufacturer to make as good a compound as he

knows how, using good rubber and any fillers he thinks best. He will be on an equal basis of competition with any other manufacturer as regards quality of the finished article. He must necessarily deliver an equal weight of vulcanized rubber gum of quality to meet the physical tests.

FUNCTION OF LITHARGE IN VULCANIZATION. Dr Henry P. Stevens (Journal British Society of Chemical Industry, May 31, 1915), presents the results of his experimental study of this subject. The state of vulcanization of a rubber product is judged by its aging and physical qualities generally. These are correlated with the coefficient of vulcanization—that is the percentage of "combined" sulphur calculated on the rubber in the product. Too high a coefficient indicates overcure and too low a coefficient an undercured condition. The correct coefficient varies with the raw rubber and type of mixing; 2.5 to 3.0 having been found to correspond with the sum of best physical condition of freshly vulcanized soft rubber. The effect of litharge in promoting vulcanization is usually attributed to the rise in temperature resulting from the reaction; $4 \text{ PbO} + 2 \text{ S}_2 = 3 \text{ PbS} + \text{PbSO}_2$. One part of sulphur is almost the exact amount required for the conversion of seven parts of litharge to lead sulphide or sulphate. Assuming 2.5 as the coefficient of vulcanization of the rubber, it follows that a mixing containing 100 parts of rubber, 5 parts of sulphur and 17 parts of litharge will contain sufficient sulphur to correctly vulcanize the rubber and also to convert all of the litharge into lead sulphide. When the mixing contains a larger proportion of litharge than this there will be insufficient sulphur to fully vulcanize the rubber and convert all the litharge to lead sulphide. If rubber and litharge are practically equal in their avidity for sulphur, this will allow the use in practice of an excess of litharge without danger of overcuring the product, provided the amount of the sulphur is restricted. The analytic data presented bear out this view and show that the coefficient of vulcanization falls when the proportion of sulphur is insufficient to convert all of the litharge to lead sulphide, and at the same time leave sufficient to cure the rubber fully.

In his investigation the author employed air-dried plantation sheet rubber of good quality. The conclusions reached were: (A) That the addition of litharge in moderate quantities increases the coefficient of vulcanization. (B) That the maximum coefficient of vulcanization is obtained where there is just sufficient sulphur to cure the rubber fully and to convert all the litharge to lead sulphide and sulphate. (C) That increasing proportions of litharge cause a progressive reduction in the coefficient of vulcanization, a larger percentage of lead sulphide and sulphate being formed. (D) That the percentage of free sulphur drops suddenly at the point where the rubber is fully cured. (E) That even with large proportions of litharge a little free sulphur always remains.

RESEARCH II.

The work of C. Harries and E. Fonrobert on the constitution of the caoutchouc molecule (Journal Society of Chemical Industry, 1915, pp. 277-279) indicates that it must have a molecular formula at least $\text{C}_{10}\text{H}_{16}\text{O}_2$.

O. Lichtenberg (Journal Society of Chemical Industry, 1915, pp. 279-280) shows the close relation of the chemical regenerates obtainable from caoutchouc and gutta percha. The transformation products of caoutchouc hydrogen halides and their thermal dissociation are described.

The swelling of caoutchouc in organic liquids has been studied by D. Spence and G. D. Kratz (Journal Society of Chemical Industry, 1915, p. 280). The capacity to swell in contact with organic liquids is not common to all kinds of caoutchouc, but is limited to the raw material. Para caoutchouc, which has been washed, dried and milled, is no longer capable of swelling. This change is occasioned by even slight milling or rolling. The swelling power of Para caoutchouc varies with the samples. If the liquids obtained from the solvents are arranged in decreasing

order according to the volume of liquid absorbed by one gram of caoutchouc the series is (1) carbon tetrachloride and chloroform, (2) carbon bisulphide, (3) benzene, toluene and xylene, and (4) ether.

PATENTED TREATMENT OF RUBBER.

RUBBER PAINT is manufactured by the British Patent Subrite Co., Ltd., under British patent No. 7,087, 1914 (E. G. Meadway). Gum mastic is added to a solution of rubber in naphtha and the mixture added to a solution of celluloid in amyl acetate.

ACCELERATORS.—British patent No. 7,370 (1914) granted to S. J. Peachy, relates to hastening vulcanization by a compound resulting from interaction of an amine of the cyclic series, with an aldehyde of the aliphatic or of the cyclic series, or of an aldehyde of the cyclic series with ammonia.

UTILIZING WASTE RUBBER.—In British patent No. 10,030 (1914) granted to H. Gare, vulcanized rubber is reduced to a paste by grinding in water and then compressed under heavy pressure.

SEPARATING CAOUTCHOUC, GUTTA PERCHA OR BALATA FROM LATEX.—In German patent No. 280,848 (1913) granted to H. Colloseus, instead of alkali specified in former patent (259,253) any substance is added to the latex which reacts with alkaline earth or salts of heavy metals with formation of compounds insoluble in water, such as water glass, borax, sodium phosphate, etc. The double decomposition of sodium sulphate with salts of alkaline earths readily coagulates the latex. The same result is produced by carbon dioxide in presence of alkaline earths. Emulsifying agents named include soap, albumin and the serum remaining after coagulation of caoutchouc.

VULCANIZING PROCESS.—In British patent No. 13,571 (1914) granted to A. Cockburn, solid tires and other massive articles are rendered non-porous by vulcanizing under pressure of about one ton per square inch by means of a liquid filling the annular space between a steel or iron mold and the article. The article is wrapped in a suitable flexible covering before being placed in the mold.

Fabrics as foundations in vulcanized rubber goods are preserved from injurious effect of sulphurous and sulphuric acids by impregnating with (1) additive compounds of ammonia with salts such as zinc sulphate and magnesium sulphate; (2) acetic or other organic acid, which is afterwards acted on by ammonia or other alkali; (3) ammonia and carbon dioxide applied together in succession, preferably under pressure during vulcanization; (4) ammonia applied alone, preferably during vulcanization. [W. E. Muntz. English patents No. 4,910—1913 and No. 3,158—1914.]

S. J. Peachy, (British Patent No. 4263, February 19, 1915). Para-nitroso-dimethylaniline or its homologues, such as para-nitroso-methylaniline, or para-nitroso-ethylaniline are employed to accelerate vulcanization. In an example, 100 parts of rubber are mixed with 10 parts of sulphur and 0.5 part of accelerating agent, the mixture being heated for 20 minutes at a temperature of 135 degrees—145 degrees Centigrade.

LEATHER OR RUBBER SUBSTITUTE.—English patent No. 13,128 (1914) has been granted to F. B. Cook for a composition of matter containing rubber, reclaimed rubber, sulphur, litharge, a filler such as tripolite, coloring matter and leather fibers.

DESTRUCTION OF RUBBER BY MICROBES.

It is said in the "Revue Scientifique" that microbes do not attack commercial rubber which is kept in dry air, but when a small amount of moisture is present certain bacteria and moulds derive nourishment from the albuminoids, resins and sugars which the rubber contains. Some microbes form on the rubber, making spots of various colors—red, yellow, black or brown—but the rubber is not materially altered thereby. On the other hand, two species of *actinomyces*, very common in garden earth and in canals, *actinomyces elastica* and *a. fustus*, assimilate the hydrocarbons of the rubber, and are in consequence capable of modifying its properties in such a way as to deprive it of all commercial value.

New Rubber Goods in the Market.

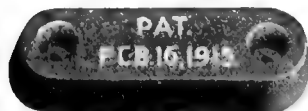
RUBBERIZED FEATHER FOR THE BATHING CAP.

A NEW novelty in bathing caps is shown in the illustration herewith. This is known as a "Robin Hood" cap, and it is constructed with a quill feather made impervious to the effect of water by rubberization. [Parker, Stearns & Co., Brooklyn, New York.]



A NEW CLOSET SEAT BUMPER.

The Star bar bumper is a new type of buffer for reducing the impact of the closet seat on the bowl. It differs in several details from similar articles of this nature hitherto marketed, including that of quality of material employed, being made of a higher grade of rubber than has generally been utilized in the manufacture of closet seat bumpers. As indicated by the accompanying cut, this buffer is of elongated formation. It is attached to the under side of the seat so that it will lie across the bowl, the nails or screws securing it to the seat for which special provision has been made in the depressions to be noted at either end—extending beyond points of contact with the edges of the bowl. [The Closet-Seat Bumper Co., Cincinnati, Ohio.]



THE BROWN SAFETY ROBE RAIL.

A distinctive feature of the new Brown Safety Robe Rail is its rubber-faced grips. The cut herewith shows one jaw open to receive part of the robe or garment. One or two turns of a specially designed key closes this jaw firmly on the wrap so that



it cannot be removed without first unlocking the rail. These jaws are faced with pyramid rubber, which has been found to be the only material suitable for this purpose, providing, as it does, the tenacity to make the device efficient by exerting sufficient pressure to hold the garment without tearing it. [Minnesota Motorobe Co., Duluth, Minnesota.]

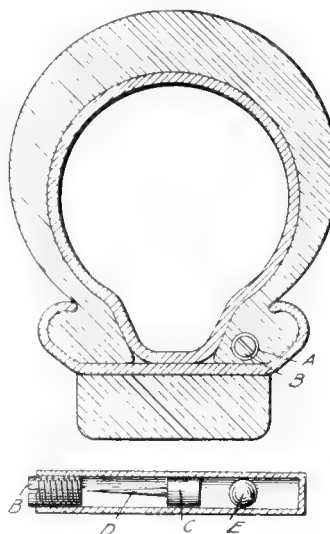
AN AUTOMOBILE RAIN SHIELD.

This illustration shows the new U-Can-C rain shield as attached to the wind shield of an automobile. It is made of transparent Pyraline and is attached to the glass by means of five rubber vacuum cups about an inch in diameter and having small buttons at the top by which they are pressed firmly against the glass. A strip of rubber packing at the back of the shield makes it impossible for rain to run down the glass and obscure the driver's view of the road. [Frey Manufacturing Co., 1514 Michigan Boulevard, Chicago.]



TIRE MILEAGE RECORDING DEVICE.

The return to a manufacturer of a worn pneumatic tire with the claim that it has not lived up to the guaranteed mileage is usually the basis for an argument. Often the manufacturer is unable to prove that the tire has fulfilled the guarantee and rather than have his customer dissatisfied he settles the claim.

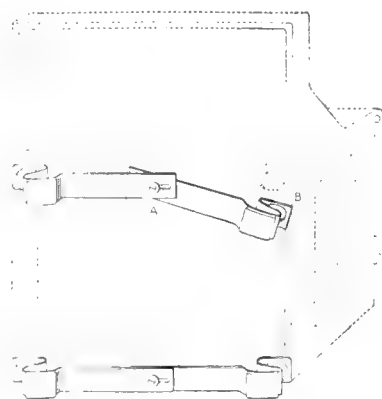


The device shown in the illustration is intended to protect the manufacturer by indicating the extent of use to which a tire has been subjected. A metal tube A is imbedded in the bead when the tire is made, at a location supposed to be known only to the manufacturer. One end is closed and the other threaded to receive a plug B of gutta percha or other material of uniform density. The head C has a boring bit D and moves freely within the metal tube, which is preferably placed, with the plug,

toward the front. When the wheel revolves the ball E is lifted and then dropped by gravity, delivering a blow on the head C at each revolution of the wheel and driving the bit D into the plug B. The length of the plug is so calculated that when a sufficient number of revolutions of the wheel has been made the boring bit will have completely penetrated the plug. Thus if the tire is guaranteed for 3,500 miles the plug will be punctured only after approximately 3,500 miles' usage, and the plug will be bored into for only a proportionate part of its length if less than this distance has been traveled. [Fred B. Carlisle, assignor to Revere Rubber Co. United States patent No. 1,137,697.]

TYPEWRITER SILENCER WITH RUBBER PADS.

The Universal Silencer, a cut of which appears below, is designed to decrease the noise of typewriter operation and to render the machine lighter and easier running.



It consists of metal strips connected in the center and bent at the ends to form springs. A hole in the end of the spring permits of its adjustment over the rubber feet of the typewriter. Thin corrugated rubber pads about an inch square are attached to the bottom of the springs, four pads to each typewriter, to prevent it from slipping on the desk. [The Universal Appliance Co., 374-6 Canal street, New York.]

A full chemical fire fighting equipment, mounted on a standard Ford chassis provided with oversize pneumatic tires, is a new feature of fire apparatus. It carries 200 feet of 3/4-inch four-ply red rubber chemical hose, in sections of 50 feet each.

"SEMIBRONZE" TUBULAR GASKET AND "GARCO" TAPE.

The purpose of the Semibronze tubular gasket illustrated is to provide a gasket that will be unaffected by heat, acids, gases, moisture, etc., and by its construction make a tight joint in almost every place, regardless of how rough or uneven the surface. It is intended for high pressure steam and is a combina-

tion of high grade asbestos metallic sheet with a metal center. It may be shaped to any flange desired and will retain its form.

The asbestos cloth used in the manufacture of this product is treated with rubber cement before being made into tape. This is also true of the asbestos material



used in the construction of the Garco Perfect Adjustable Gasket Tape, a new flat gasket material recently put on the market. This tape is put up in continuous rolls, in boxes containing ten to twelve pounds, and from it gaskets of any desired size can be made, without waste or the use of other equipment. This type of gasket is suitable for use in boilers, pipes and the like and is guaranteed by the manufacturer for any pressure, as well as not to burn or blow out. [General Asbestos & Rubber Co., Charleston, South Carolina.]

THE "COLONEL" ERASER.

The makers of the famous "Colonel" golf ball have turned their attention to the production of rubber erasers, a full line of which is now being marketed. This eraser is stated to be superior in quality

and the result of exhaustive experiments. It is made in all the forms in which rubber erasers have become familiar, for general and specific requirements. For typewriter use it is made in circular shape as well as in the flat



strip with bevel edge. A soft, velvety and quick acting eraser, in red or white, is made for architects and draftsmen, and a green beveled rubber for use on tracing cloth. The pencil eraser for general use is made of a firmer quality of rubber, in red and green. [St. Mungo Manufacturing Co., Glasgow, Scotland.]

FIREPROOF GAS TUBING.

Fireproof gas tubing for use with portable lamps and appliances is now being made, in which a layer of chicle is employed. This tubing is made up with an inside layer of spiral wire, outside of which are successive layers of waxed fiber, woven material, chicle, twine binding fiber and asbestos, with an outer cover of spiral wire. [New York Gas Tubing Co., 97 Bank street, New York.]

Golf players who feel an irresistible impulse at the beginning of a stroke to turn the head to see where the ball will probably go, may be interested in a device intended as an aid to the suppression of this inclination. It consists of an elastic cord or tube with a soft rubber mouthpiece, attached to a belt. The golfer is reminded by a sudden tug on the mouthpiece—which he holds in his teeth—each time he involuntarily turns his head.

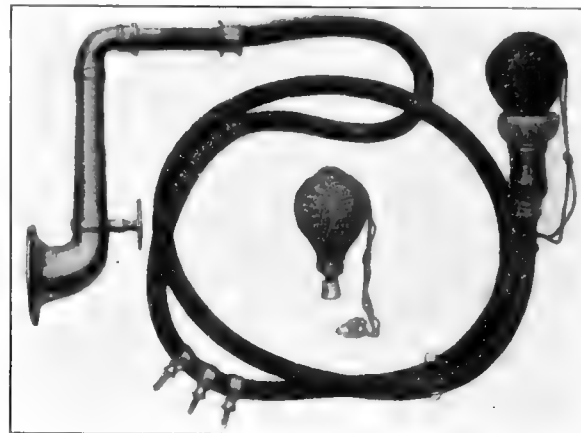
RUBBER HOB NAIL.



A rubber hob nail which when applied to the soles and heels of shoes prevents their scratching or damaging polished floors is illustrated herewith. This hob is provided with a center nail for ease of attachment to the shoe. [Alex. Taylor & Co., Inc., 26 East Forty-second street, New York.]

SPEAKING TUBE AND CALL SIGNAL.

Here are illustrated two new articles in rubber being offered by a leading English firm which has a special department devoted to the manufacture of rubber accessories for domestic use. The first is a speaking tube of rubber, made in diameters of $\frac{1}{4}$, $\frac{3}{4}$ and $\frac{7}{8}$ of an inch and covered with



braided worsted or silk or with the two combined. Attached to the tube is a silk-covered rubber bulb, pressure on which causes a whistle to blow at the other end of the tube. This is a type of speaking tube recommended also for automobile use.

The second illustration is of a device known as the invalid's friend, being a call signal for use of invalids. It consists of a length of flexible worsted-covered rubber tubing with an inflated rubber ball mounted on a brass or wood cup



at one end and a call signal on the other. The tubing leads from the invalid's couch to any desired point, and a slight pressure on the rubber ball is sufficient to sound the signal in another room. [Sheath Bros., 87 City Road, London, England.]

SELF-VULCANIZING REPAIR PRODUCTS.

Several products for the repair of rubber goods are now being offered which require neither cement, driers nor heat in their application, being self-vulcanizing. Vulcanizit, Kutiller, Sandblast and Newtred are the names applied to the tire repair products, each suggestive of the particular use for which it is intended; while Patchit is a preparation, in white or black, for the repair of air cushions, hot water bottles, footwear, etc. These preparations are sold under guarantee of the manufacturers. [Self-Vulcanizing Products Works, Morristown, New Jersey.]

RUBBER IN BUNION RELIEVERS

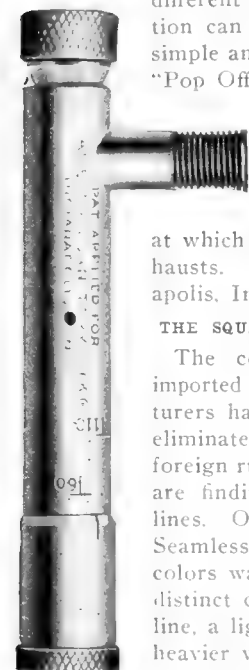
Among the new devices for the relief of foot troubles is the Wizard adjustable bunion and callous remover and arch builder. This device is worn inside the shoe, being an insole of fine, smooth leather with pockets arranged for the insertion of soft, round rubber pads varying in thickness from one-sixteenth to one-quarter of an inch at the center and tapering to a very thin edge. The illustration shows these rubber pads inserted in two of the four pockets, which are supposed to come directly back of the bunion or callous



place. By relieving pressure on the joints, the device is supposed not only to build up the arch but also to remove callous places and corns from the bottom of the feet. [Wizard Foot Appliance Co., St. Louis, Missouri.]

THE "POP OFF" TIRE GAGE.

In order that tires may give most satisfactory and lasting service various degrees of air pressure are recommended for different loads; and the degree of a tire's inflation can only be measured by a tire gage. A simple and inexpensive device of this kind is the "Pop Off" gage, a cut of which is here shown.



In use, the indicator is set at the desired amount of air pressure and the air line or pump is fastened to the side of the gage and started.

When the pressure reaches the point at which the indicator is set the surplus air exhausts. [American Sanitary Lock Co. Indianapolis, Indiana.]

THE SQUAWKER BALLOON WITH PATENT VALVE.

The competition of the cheap hand-made imported toy balloon, which American manufacturers have never been able to meet, has been eliminated for the present by the situation in foreign rubber manufacture, and home producers are finding readier sales for the higher-grade lines. One of these is the "Faultless" Quality Seamless "Squawker," which is made in assorted colors warranted fast and non-poisonous. Two distinct classes of balloons are included in this line, a light weight for inflating with air, and a heavier weight, chemically treated type for gas inflation.

A new valve of a practical and simple nature has also been introduced by this company and is used in its balloons where desired, at a very small advance in price over the ordinary variety. This valve does away with the use of the reed stock and requires no sharp instrument to operate it. After inflating the balloon a turn of the valve to the right closes the air tube; to deflate, it is given a turn to the left. [The Faultless Rubber Co., Ashland, Ohio.]

A sanitary device known as the "Renelise" nipple turner is now in use with the drug trade. It is a solid glass stand, the upper end of which is so formed that rubber nipples of every sort may be turned inside out over it, facilitating their sterilization. [Renelise Nipple Turner Co., 5859 Romaine street, St. Louis, Missouri.]

DRIPLESS POUR REGULATOR.

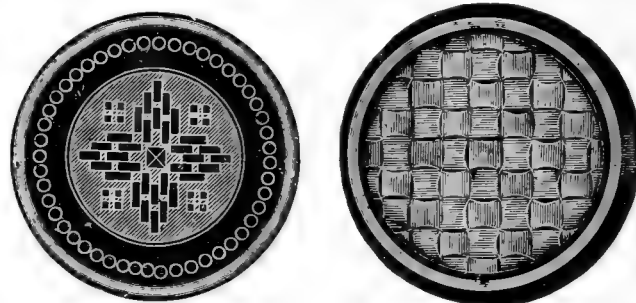
The accompanying illustration shows an entirely new and practical bottle closure and pouring device, the intention of which is to eliminate the annoyance of dripping which follows the pouring of liquid from bottles, and also to preserve the purity and quality of the bottle's contents.

As illustrated this closure is made for an ink bottle and is of hard rubber substitute, although the practicability of such a stopper made of rubber, in the bottling of various liquids, is easily apparent. The stopper, on which patent has been applied for, has a liquid outlet near the top, also an air vent on the other side. By a turn of the spout to the right the bottle is hermetically sealed, insuring the preservation of its contents. To open the pourout, the spout is turned to the left until it stops, when a perpendicular stream can be poured from the outlet. The flow can be regulated by applying the finger to the air vent. [S. S. Stafford, Inc., 603-9 Washington street, New York.]



HARD RUBBER HARNESS ROSETTES.

The accompanying illustrations show two late designs in hard rubber rosettes, a very extensive line of which is being turned out by the manufacturers for use in connection with hard rubber trimming for fine and medium grades of harness. Hard rubber as a trimming for harness is not a new idea, but the variety



of designs and extent of its use have rapidly increased since its introduction for this purpose. As a harness trimming it is said to be almost indestructible, outwearing the leather parts in all cases, and it is held in great favor by harness makers and drivers also because of the ease with which it may be cared for. [Rubber & Celluloid Harness Trimming Co., Newark, New Jersey.]

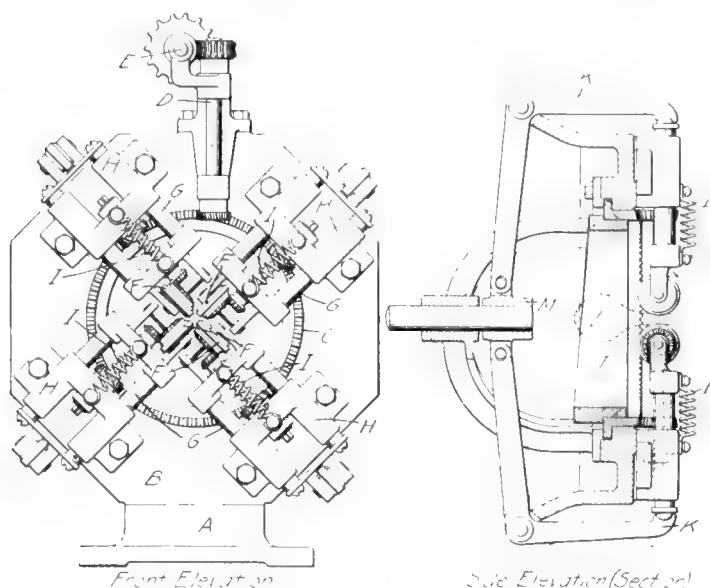
A molded soft rubber cushion or anti-rattler fitted over the natural teeth has been found effective in absorbing the jar and chattering caused by rapid driving over a brick-paved speedway in racing. This device was worn by Art. Klein in the recent 500-mile race on the Indianapolis Speedway.

There has recently been developed and is being opened to the trade a material having properties between the formaldehyde products, such as Bakelite and Condensite, and the best known grades of shellac compositions. This new material is styled "Grade 57-Hi-Heet." It has a heat resistance of 250 degrees Fahrenheit, can readily be molded in any form or size, has a tensile strength superior to shellac compositions and a dielectric strength of 285 volts at a thickness of 250 mils. The main advantage of this material is high heat resistance, and lower cost than the formaldehyde products. [The General Insulate Co., Brooklyn, New York.]

New Machines and Appliances.

TOY BALLOON STRIPPING MACHINE.

IN the manufacture of toy balloons the operation of stripping the molds by hand is very tedious and is accomplished with difficulty. The illustration shows Edwards' invention for doing this work mechanically. Referring to the front elevation



shown in the illustration, *A* is the base which supports the frame *B*, in the central opening of which revolves a ring gear *C*, driven by the upright shaft *D* from the driving shaft *E*.

The four rubber covered stripping wheels *F* are mounted on separate shafts journaled in sliding frames *G*, that slide in brackets *H* secured to the frame *B*. The stripping wheels are driven from the ring gear *C* by bevel gearing and are kept apart by the four springs *I*. Referring to the side elevation (section) in the illustration, the mold *L* is shown in the position for stripping off the balloon. The cam *J* revolves with the gear ring and acts on the four bell cranks *K* and the sliding collar *M*, throwing the stripping wheels together and in firm gripping contact with the mold.

As the mold is pulled outward by the operator the springs tend to force the stripping wheels apart, while the cam, acting through the bell crank levers, holds them positively in firm contact with the irregularly shaped mold, and strips off the balloon. [Bruce V. Edwards, assignor to Edwards Engineering & Manufacturing Co. United States patent No. 1,142,945.]

PATTEN'S SOLE CUTTING MACHINE.

In machines of this class it is often necessary to make an abrupt change at one or two points in the travel of the leader. At such times lost motion or vibration may cause a slight movement of the leader resulting in defective cutting of the material.

This invention provides means for holding the leader immovable during the travel of the knife and also for accurately registering it when it is to be held stationary.

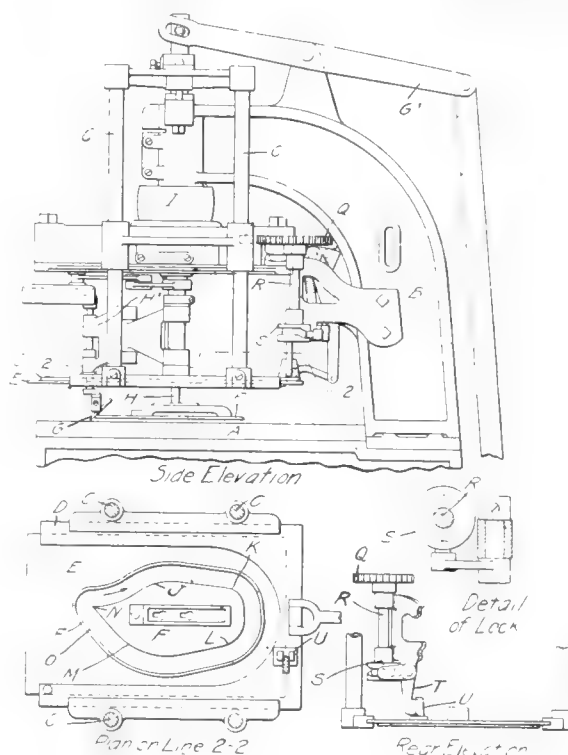
Referring to the side elevation in the illustration, *A* is the base plate and *B* the curved frame that supports the operative parts of the machine. Secured to the lower ends of the four vertical rods *C* are two slide ways that support the slide *D* to which is fastened a leader *E*. This co-operates with the knife form *F* in guiding the knife *G* throughout the circuit of its

travel. The form *F* acts as a presser foot to hold down the work and is secured to the lower end of the stem *H*, which is raised and lowered by the lever *G'*. The knife carrier *H'* is mounted on the stem *H* and is swung around the axis of the rod by the usual devices operated by the belt pulley *I*.

Referring to the plan on line 2-2, when a tap is being cut of the size for which the opening has been designed, the leader is held stationary while the knife completes the circuit. In cutting a tap larger than the regular size, as the knife travels in the direction of the arrow from the point *J* to *K* the leader and slide are shifted to the right and while the knife is passing from *L* to *M* the leader and slide are shifted back to the left to their first position. Throughout the remainder of their operation the leader and slide are held absolutely stationary, to insure accurate cutting, especially around the point *N*.

When smaller taps are to be cut the leader and slide are moved to the left as the knife passes from *J* to *K* and to the right in passing from *L* to *M*. While the leader is designed for a middle or intermediate size, it is also used to cut either larger or smaller taps a different form *O* being used for each size that it cut.

The rear elevation shows the slide locking device driven by the gear *Q* that is fixed to the upright shaft *R* journaled to a bracket bolted to the frame *B*. The cam *X* is attached to the lower end of the shaft *R* and operates the arm *T* that engages a slotted lug *U* fixed to the leader slide. The cam is timed to swing the arm into engagement with the lug when the knife reaches the point *M* and to hold it firmly while the knife passes from *M* around *N* to *J*. When the knife reaches *J* the lug is released while the knife travels from *J* to *M*. When the wedge-



shaped arm engages the lug the leader is accurately positioned and firmly held. By means of an adjusting screw the arm *T* can be adjusted to compensate for wear of the cam, the lug or the arm. [Ernest L. Patten, assignor to Wellman Co. United States patent No. 1,144,429.]

HOLLOW BALL MOLD AND PRESS.

Inflated balls are made by first forming the sections *J* (see Fig. 2) and then joining them together. This consists of a lower and upper section, *J* and *K*, respectively, the latter having an annular flange *L* which forms a rim for the upper section. The sections are then joined together by the combined action of a press, which is shown in cross section *30*.

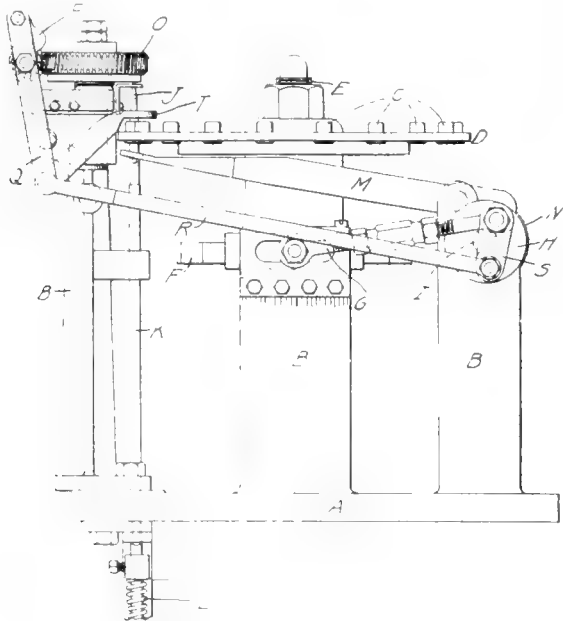
The press and mold consist of an upper and lower dies aligned by two wedge pieces *11* and opened and closed by a screw. This has a square head *21* and is turned by the spindle *30* that passes through the cover *25* of the chamber *30*. Compressed air is forced into the chamber through pipe *33*, the molds are closed and steam applied until the balls are vulcanized.

Fig. 9 shows a modification in which the upper mold section is supported upon springs *51* and the molds are forced together by a vertical shaft *52* operated by a lever *56* and a counterweight. [R. H. Rosenfeld and F. T. Roberts, Trenton, New Jersey. British patent No. 4,623, 1914.]

MACHINE FOR PUNCHING NIPPLES.

The object of this invention is to provide a machine for punching the central holes in nipples, of any size that may be required, in a rapid and uniform manner.

The base *A* rests on a suitable bench or table and carries the three standards *B* that support the operative parts of the machine.



The nipples to be punched are placed on the thimbles *C* arranged in a circle on a head *D* that revolves on the upright spindle *I*. The head is turned intermittently by the horizontal ratchet-wheel *I* and pawl attached to a slide reciprocated by the connecting rod *K* driven by the disc crank *H* upon the driving shaft *I*. The nipples on the thimbles are punched by the punch *L*, carried on a rod *K* which extends down through the base and is raised normally by the spring *M*. The punch rod is forced down intermittently by the pivoted lever *N* which is operated by the ratchet wheel *I*. This is done by the action of the spring.

The punch block *O* is revolved by worm gearing that is moved intermittently by a pawl *P*. The levers *Q* and *R* are connected to this pawl and are driven from the main shaft *I* by the crank arm *S*. As the head *D* rotates the hook-shaped lever *T* removes the punched nipple from the thimble. The size of the holes is regulated by raising and lowering the stretcher plate interposed between the punch *L* and the punch block *O*. [Jeremiah L. Mahoney. United States patent No. 1,144,045.]

MACHINE FOR MAKING TUBULAR CORD.

Tew's machine twists the strands of yarn into a hollow cord and at the same time impregnates them with rubber solution. This not only cements the strands together but insulates them and prevents the wearing of one against the other.

Referring to the illustration, which is a side elevation, *A* is the frame of the machine and *B* the uprights that support the bobbins *C*. The strands *D* are led over guide rollers *E* mounted in the top frame which is supported by the standards *F*. The strands then pass down through the stationary casing *G*, in which they are impregnated with rubber solution supplied through pipe *H*.

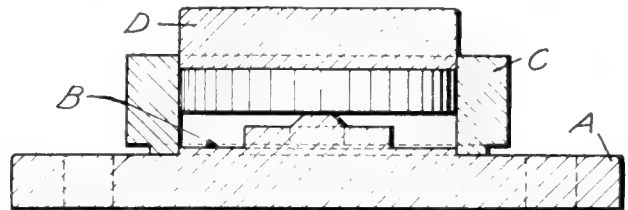
Within the casing the strands converge about a conical former and pass through a tubular die that acts as a guide for the cord *I*. The completed cord then passes through the hollow journal of the frame and around guide pulleys *J* and *K* to the bobbin *L*. When the frame *M* is rotated by bevel gearing connected to the driving shaft *N*, the

strands are twisted into a tubular cord, which is drawn down and wound up on the traveling bobbin. [J. D. Tew. British patent No. 12630-1914.]

WASTE RUBBER HEEL MOLD.

The object of this invention is to provide a mold by which a heel can be made from vulcanized rubber waste without risk of the mold bursting and without any "spew" on the edges.

The mold is made of steel, in three parts, as shown in the illustration: *A* a base, which is in the form of a plate; a cen-



tral part *B*, which is raised and forms the bottom face of the mold, and a ring *C*, which forms the vertical wall of the mold.

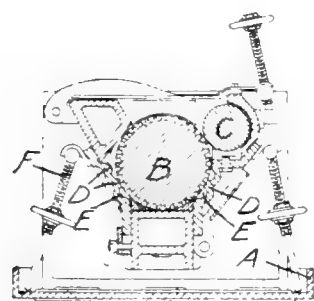
The ring *C* at its base fits concentrically around the part *B* and receives a ram or plunger, *D*, which has a close piston-like fit and is designed to slide within the ring *C*.

The central raised part of the plate is suitably engraved with the brand or name which the finished heel is to carry.

In making heels, the piece of rubber waste, which has previously been cut to the approximate size and shape, is inserted in the ram or plunger being removed in the ring C. The ram is then placed in position on the rubber in the ring, the upper surface of the rubber lying just below the top of the ring, and the mold thus charged is placed under a screw or other form of press for giving the necessary pressure. [S. Cooke and W. C. Davis, of England, United States patent No. 1,140,577.]

A NEW ENGLISH WASHER.

This machine, for washing rubber, particularly rubber mixed with bark, sand, etc., is mounted in a trough A and consists of an inclined grooved roller B and one or more plain rollers C. The roller B is driven by gearing and the rollers C either frictionally or by gearing. The material is supplied through a hopper and forced along the rollers towards the upper end by means of inclined guides. The sides of the casing are formed with a number of longitudinal projections D and pockets E co-acting with the roller B. The sides of the casing are hinged and held in place by adjustable struts F. Parts of the apparatus may be steam-jacketed. Water is admitted near the upper end of the machine, and the sand, etc., is discharged at the lower end into a tray and thence into the trough A, which has strainers to retain the rubber. [W. G. Gass, British patent No. 1,200, 1914.]

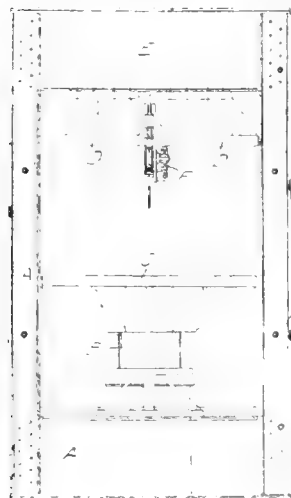


towards the upper end by means of inclined guides. The sides of the casing are formed with a number of longitudinal projections D and pockets E co-acting with the roller B. The sides of the casing are hinged and held in place by adjustable struts F. Parts of the apparatus may be steam-jacketed. Water is admitted near the upper end of the machine, and the sand, etc., is discharged at the lower end into a tray and thence into the trough A, which has strainers to retain the rubber. [W. G. Gass, British patent No. 1,200, 1914.]

The same inventor has patented a washing, macerating or creping machine with a hinged roller that can be readily removed from the bearings. [British patent No. 1,199, 1914.]

HYDRAULIC SOLID TIRE PRESS.

The ordinary press used in applying solid tires to heavy rims or track wheels is not designed to facilitate the handling of heavy weights. A German invention, however, provides a press with a divided head, and an overhead track with a traveling hoist capable of loading and unloading heavy wheels or rims directly on the platen of the press.



Referring to the illustration, the forged steel base A supports the hydraulic cylinder and ram B upon which is mounted the platen C. The head D is made in two parts which are bolted to the crosshead with sufficient space between to accommodate the overhead track and chain hoist F. [Continental Caoutchouc & Gutta Percha Co., Hanover. German patent No. 628,518.]

OTHER DEVICES

MACHINE FOR TESTING HARDNESS.—This invention is a device by which the hardness of material is measured by the penetration of a hard ball under an adjustable load and the result indicated on a vernier. The operation is as follows: The piece to be tested is placed on the anvil and by manipulation of the levers the ball is brought into contact with the surface to be tested. At this stage there is no load on the counter-balanced lever. Two rods connected with the indicating mechanism are adjusted to just touch the test piece when the index reads zero. Through the system of counterbalanced levers, weight is applied, causing the

ball to sink into the test piece. The hand crank, sprocket wheels and chain are used to raise and lower the weights. The depth of penetration is directly proportional to the hardness of the material and the reading on the scale is made to indicate this. By proper calibration, in terms of the units desired. [Tinius Olsen, United States patent No. 1,141,881.]

BARDER'S VULCANIZER DOOR.—The door is provided with two series of circumferentially spaced lugs extending outwardly. The shell has two series of spaced lugs extending inwardly, the spacing being arranged to permit the lugs of the door to pass through. By a partial rotation of the door the various lugs are made to interlock, thereby effectively sealing the vulcanizer. [B. R. Barder, United States patent No. 1,144,683.]

BRAIDING MACHINE.—Lundgren employs in this invention a fixed annular trackway for the independent carriers. He also divides the actuating mechanism for the set of separate carriers for one set of thread-supplying devices, by the path through which the threads of the other set of thread supplying devices are moved, and supports part of the mechanism on one side and the other part on the other side of the path. [J. Lundgren, assignor to the Carlson-Wenstrom Manufacturing Co., United States patent No. 1,144,716.]

CAR VULCANIZER.—It consists of a clamp and two plates between which the part to be vulcanized is held. On the upper plate is placed a block of slow burning material of such size that when ignited it will generate sufficient heat to completely vulcanize the repair. The following slow burning compositions are suggested: (1) potassium nitrate 25 gr., gum 20 gr., potassium chlorate 5 gr., charcoal 8 gr., cascarilla 10 gr., ground glass 9 gr., plaster of paris 10 gr., wood dust 8 gr., Venetian red 10 gr.; (2) wood dust 3 gr., potassium nitrate 30 gr., tragacanth 5 gr., gum 5 gr.; (3) charcoal 224 gr., coarse prunella 256 gr., chlorate of potash 32 gr., infusorial earth 160 gr., gum 120 gr., water 5 drams. [W. H. Miles, British patent No. 4,313—1914.]

REPAIR VULCANIZER.—The heating and pressure surface is formed by a plaster cast of the part to be repaired. Deep cuts are temporarily filled with soap so that they are not molded. The plaster cast is carried by a support that is fastened to a steam chamber or other heating device. [H. C. Reading, British patent No. 4,283—1914.]

COLLAPSIBLE CORE.—The adjacent ends of the four sections have slotted flanges and are held in alignment by flange plates which are slotted to receive the clamping bolts. In assembling the core three sections are placed together and the bolts moved in locking position and fastened. The key section is then aligned and the bolts slid in place and fastened. In removing the core from the casing the bolts are loosened and slid out of the locking position, and the key section removed. The other sections are then easily removed from the casing. [P. E. Welton, United States patent No. 1,144,671.]

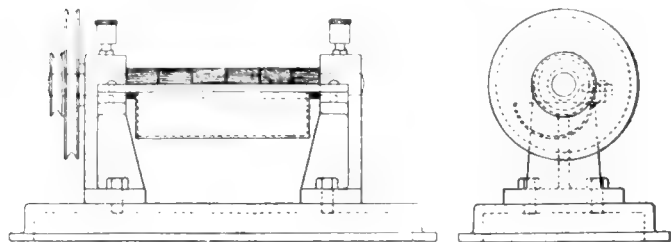
LATEX COAGULATED APPARATUS.—A grooved, corrugated, perforated or plain horizontal drum is mounted in a smoke chamber and is revolved by a hand crank in a trough containing latex. The smoke is led from a furnace to the smoke chamber by a pipe which terminates in the trough at a point near the surface of the latex. [R. S. Agar, Ceylon, British patent No. 6,215, 1914.]

MACHINE FOR PREPARING VULCANIZED RUBBER FOR ANALYSIS.

R. Wheatley and B. D. Porritt have perfected a simple device for the above purpose by which the essential requirements of correct sampling are met, namely, accurate representation, uniformity and suitability of condition for analytic treatment and speed of sampling.

The machine has a bed-plate 7 x 14 inches on which a pair of pedestals is mounted to carry the bar supporting the objects for sampling, and the tray to receive the sample, also

the cutting roll. The latter is a cylindrical file, 1 inch in diameter by 6 inches long, mounted on bearings and driven by a one-horse power electric motor belted to either of two grooved pulleys by means of which variable speeds may be imparted to the roll. The preferable speeds are 1,200 and 2,400 revolutions per minute, corresponding to surface speeds of 314 and 628 feet per minute. The lower speed



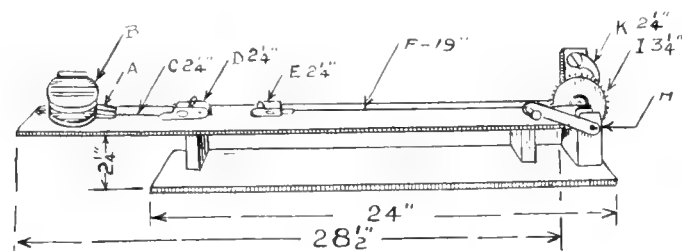
is adapted to the harder qualities and the higher to the softer qualities. The machine samples effectively all grades of cured rubber from vulcanite to pure soft rubber.

By its use small samples of vulcanized rubber are prepared without change of composition. Owing to its finely divided condition, the sample must be protected from oxidation unless immediately used, and for the same reason precautions must be exercised against oxidation during analysis.

This machine is identical in principle to that invented by Thomas Gare for powdering vulcanized rubber preparatory to reclaiming. United States patent 969,100 (1910).

A "PERMANENT SET" TESTING MACHINE.

Under the present methods of procedure of the Underwriters' Laboratories for physical testing of rubber insulation, a new factor has been introduced in obtaining the so-called "permanent set" on a stretched test piece. The insulation is required to be stretched from 2 to 5 inches for insulation $\frac{4}{64}$ inch or under or



from 2 to 4 inches for insulation $\frac{5}{64}$ inch or over, held at that mark for 2 minutes and then released. Two minutes after release the marks should not be more than $2\frac{1}{2}$ inches apart.

A simple apparatus has been designed by M. M. Kahn, of the New York Insulated Wire Co., and in use in the laboratory of that company, especially to take care of the above mentioned test.

Referring to the illustration, *A* is a Eureka silk tester graduated in quarter pounds up to a maximum of 20 pounds; *B* is a heavy glass cover to protect the dial, and *C* is a 2-inch strip of leather, one end attached to the tester *A* and the other end to the clamp *D*. The clamps *D* and *E* are provided with two pins, one being fixed and the other working freely in the socket. *F* is another leather strip, one end of which is fastened to the clamp *E* and the other to the shaft. *H* is the hand crank, *I* the ratchet wheel and *K* the pawl that holds the tension wherever desired.

In making the test a piece of insulation about 8 inches in length has marks placed upon it, 2 inches apart. Each end is passed around, then under and through the clamp, so that when stretched the tension pulls the movable pin against the insulation and prevents it from slipping. The pawl is set on the ratchet wheel and the lever is rotated, stretching the test-piece until the marks are 5 inches apart. After the sample has remained under tension the

required 2 minutes it is released by raising the pawl and taken out and the set noted. When permanent set has been obtained the test piece can be replaced in the clamps and stretched to the breaking point. For simple tests on elongation and rupture the pawl can be released.

The apparatus can also be used in testing any kind of strip rubber where permanent set, elongation and tensile strength are required.

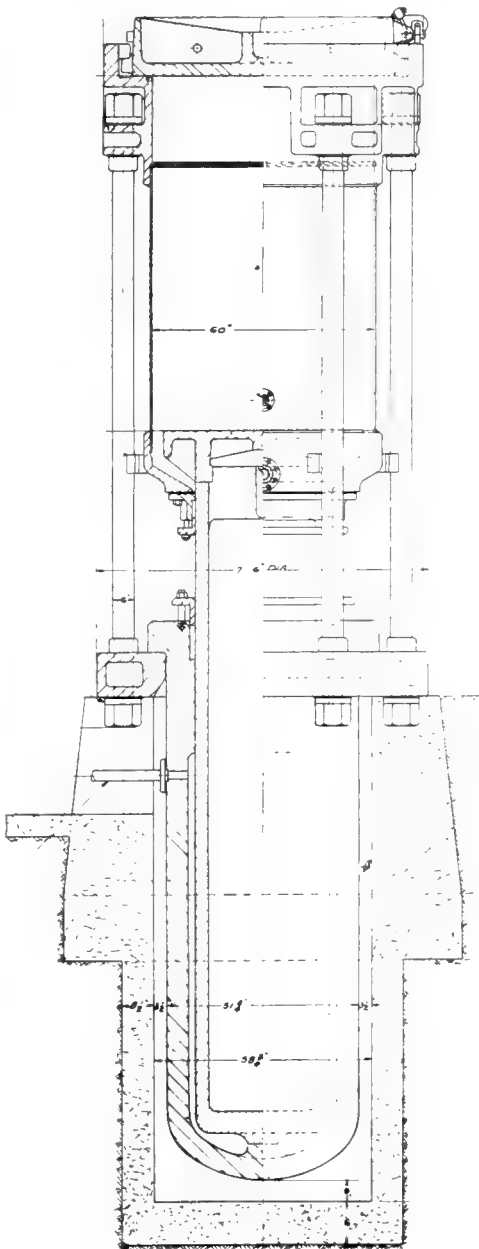
ONE THOUSAND TON TRUCK TIRE PRESS.

There has been a constant demand for increased pressure on truck tire molds during vulcanization, which has resulted in the construction of the press illustrated herewith. Its weight is sixty-five tons. It has a thirty-six-inch diameter

ram, and is designed for a hydraulic working pressure of two thousand pounds per square inch. The vulcanizing chamber is sixty inches in diameter and is adequate to take a stack of molds twelve feet in height. The height of the entire press over all is thirty-five feet, but when installed below the level of the curing room floor, only three feet of the press project above the floor.

This press is equipped with the Akron-Williams boltless, quick opening type head, which is lifted out of the way, leaving the vulcanizing chamber entirely unobstructed when molds are to be inserted or removed. The separate outside packing glands are provided for both steam and water, and an oiling ring lubricates the ram, cylinder and glands.

To provide for the enormous ram thrust it is equipped with six 6-inch stay bolts, and the vulcanizer shell itself is subject to steam pressure only, thus relieving the shell from all hydraulic pressure. This press provides efficient and economical means of vulcanizing truck tires under high pressure. [The Williams Foundry & Machine Co., Akron, Ohio.]



THE EDITOR'S BOOK TABLE.

RUBBER PRODUCING COMPANIES, 1915. MINING, LATE, TEA and Rubber Share Brokers' Association, Ltd., London. Bound covers, 8vo, 547 pp. Price 3 shillings.

THIS hand-book presents, in form convenient for ready reference, concise, authentic data concerning the financial condition and operation of 526 companies representing issued capital of £57,361,000, an increase of £5,884,000; though showing four companies less than were listed in the same hand-book for 1913. Plantation companies have studied economy of management with good effect and a large proportion of them should be making 100 per cent profit at a selling price for rubber of 2 shillings per pound. Cost of production may be expected to drop to 9 pence per pound with well managed companies. At the outbreak of the war governmental assistance averted anything like a crisis and the financing of the industry soon became normal.

The book closes with a list of plantation company secretaries and addresses. It will be found very useful to investors and others seeking reliable information in regard to the planting industry in the Far East.

INDEX TO PATENTS, TECHNOLOGY AND BIBLIOGRAPHY OF China Wood Oil and Tung Oil. A compilation of everything that has been mentioned in Ethereal Oil (China Wood Oil), with translations, and names of authors and publications. Compiled and published by George H. Stevens and J. Warren Armitage. Two vols. or two parts each, comprising nearly 2,000 pages. [Quarto, paper covers, 136 pages.]

As the title above implies, this publication is simply an index, but it is an index of an unusual character, as it fills over 130 pages and contains over 40,000 references. The compilation on the subject of China wood oil—of which this publication is but the index—has engaged the energies of these two authors for a year and a half, and it contains matter taken from over 800 publications. More than half of the matter is taken from foreign sources and has never appeared before in English, being especially translated for this work. This compilation consists of careful transcripts, translations, photographs and blue prints, of every separate article that has ever been printed on this subject. These various items have been arranged on uniform sized sheets and bound together between handsome loose leaf covers into four large volumes, as a manuscript edition, and the contents are thoroughly covered by the 40,000 citations given in the index.

The rubber manufacturer will find quite a good many references to rubber and kindred substances. For instance, under "Rubber" there are 51 references; under "Rubber-like Products," 12; under "Rubber Resins," 40; under "Various Caoutchouc-like Materials, Mixtures and Substitutes," 15. There are 22 references to factice. Substitutes for rubber have 26 references, vulcanization, 19, and related subjects, 20.

The work, itself, consists of four large books. Only a few of these complete books have been made up at the start, as it is the intention of the authors to supply purchasers with pages on such subjects as they are interested in. Anyone looking through the index and discovering references to matter which he would like to get can find out the cost and other details by writing to either of the two compilers, George H. Stevens, 77 Orange avenue, Irvington, New Jersey, or J. Warren Armitage, 886 Lake street, Newark, New Jersey.

FIELD PRACTICE. AN INSPECTION MANUAL FOR PROPERTY Owners, Fire Departments and Inspection Offices. Covering Common Fire Hazards and their Safeguarding and Fire Protection and Upkeep. Published by the National Fire Protection Association, Boston, Massachusetts. 190 pages, leather bound. Price \$1.50.

As indicated by the title, this book covers the whole field of fire protection—the means of safeguarding or removing the causes which originate fires; the providing of means which may make it possible to confine fire to the space where it originates, and the necessary means of extinguishing fire. The whole subject is treated in detail. This manual will serve as a guide for

property owners, as well as for municipalities, fire department inspection offices, and for factory superintendents.

DEPRECIATION IN THE RETAIL SHOE BUSINESS.

The Bureau of Business Research connected with the Graduate's School of Business Administration of Harvard University, has issued, since the foundation of that school a few years ago a number of bulletins on different phases of business administration. Bulletin No. 4, "Depreciation in the Retail Shoe Business," has just come from the press in the form of an octavo pamphlet of 32 pages. The object of this bulletin is to explain the treatment of inventories and depreciation on the profit and loss statement of the Harvard system of accounts for shoe retailers, and also to show how the profit and loss statement is derived from the set of double entry books as usually kept. Shoe retailers, including those who deal in rubber footwear, will find this pamphlet exceedingly helpful in showing them how best to charge off the natural depreciation of their stock. The bulletin is sold for 50 cents, and is printed by the Harvard University Press, Cambridge, Massachusetts.

MONETARY SYSTEMS OF LATIN-AMERICA.

The National City Bank of New York has issued a number of interesting publications relating to commercial matters in South America and intended primarily to show to the manufacturers and importers of the United States something of the field for their operations that is offered by the Latin-American countries. A pamphlet of 32 pages just issued by the National Bank and written by Joseph T. Cosby, manager of its foreign department, is entitled, "Latin-American Monetary Systems and Exchange Conditions," and in a concise way it gives the information covered by its title. Taking the various southern republics in alphabetical order, it describes the monetary system of each and the methods by which exchange is effected. This little publication must prove of value to all who wish to do business with our southern neighbors.

REGISTRATION OF TRADE MARKS IN LATIN AMERICA.

American manufacturers who plan to extend the sale of their trade-marked goods in Latin American countries should avail themselves of the information placed at their disposal by the Department of Commerce, Bureau of Foreign and Domestic Commerce, E. E. Pratt, chief. The Department has issued "Tariff Series No. 31," on "Registration of Trade Marks in Latin America."

FIRST ANNUAL REPORT OF THE INTERNATIONAL ASSOCIATION FOR RUBBER CULTIVATION IN THE NETHERLAND INDIES.

This association was projected in December, 1913, by various persons of Dutch and other nationality interested in the cultivation of rubber in the Netherland Indies, for the purpose of serving the general interests by uniting the different groups connected with this cultivation. The membership numbers 155, of which 61 are companies. The association is assured of the friendly co-operation of the planters' associations in the Netherlands Indies. It has rendered valuable assistance in the financing of many estates in the war crisis and following the war will doubtless enter an enlarged field of regular and productive work.

PRIZES FOR PLANS OF RUBBER ESTATE FACTORIES.

The council of the association has recently offered prizes for plans for complete rubber estate factories for the making of crêpe and smoked sheet. Both plans are to be adapted for a capacity, to begin with, of 100,000 kilos [220,460 pounds] of dry rubber per annum, which by three extensions can be increased to 250,000 kilos [551,156 pounds]. The first prize is 1,500 florins [\$603] and the second 500 florins [\$201]. Competition closes March 1, 1916, and designs are to be sent in to the office of the association, 13, Kneuterdyk, The Hague, or to its office at Medan, Deli. Particulars can be obtained from the association.

the laws and regulations governing the registration of trade marks in Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Ecuador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Salvador, Santo Domingo, Uruguay, Venezuela. Announcement is made that the committee will furnish information in answer to inquiries concerning such laws, and attention is called to the importance of the legal point of view as to the ownership of trade marks between the Latin American countries and the United States. The importance of registration is greater in the Latin American countries than in the latter, in view of the possibilities of obtaining registration under the trade-mark laws in effect in Latin American countries where registration is usually granted without investigation of the right to its use and once effected is valid against all later comers.

A TENTATIVE LIST OF SOFT RUBBER DRUGGISTS' SUNDRIES.

THE importers of drug sundries and rubber goods have had reason on many occasions to protest against decisions made by the New York appraisers. Drug sundries are assessed at 15 per cent. duty while rubber goods carry 10 per cent. It is therefore quite important that the distinction between drug sundries and rubber goods be made as definite as possible. As a suggestion to the Classification Committee of the United States Customs, the Drug Sundries Division of the Rubber Club of America has prepared the following list of soft rubber druggists' sundries which has been approved by 17 manufacturers of this class of goods.

SOFT RUBBER DRUGGISTS' SUNDRIES.

Air Beds	Dam (Dental)
Air Pillows & Mattresses	Diapers
Applicators	Dilators
Aprons (Surgeons', Sanitary)	Empyema Tubes
Atomizer Bulb Sets	Ether Bags
Baby Pacifiers	Face Masks
Bags (Breeder, Gonorrhea,	Finger Cots
Ear, Throat, Mastoid, Intra-	Fittings for Nursing Bottles
Gastric, Face, Gas, Sterile	Funnels (Soft Rubber)
Dressing, Ice, Pulitzer,	Gloves (Autopsy, Household,
Sponge, Blood-Pressure,	Obstetrical, Surgeons', Vet-
etc.)	erinary, etc.)
Bandages	Gum (Bandages)
Basins	Hospital Blankets
Bath Sprays	Ice Helmets
Bed-Pans	Invalid Cushions
Belts (Umbilical, Abdominal,	Medicine Droppers (unless
Gum, Perforated Frictional	glass chief value)
Belts, etc.)	Nasal Feeding Tubes
Bibs	Nipple Shields
Bougies	Nipples
Breast Pumps	Obstetrical and Operating
Breast Shields	Cushions
Brushes (Complexion, Hand,	Obstetrical Sleeves
Bath, Flesh, Tooth, etc.)	Operating Caps and Pads
Bulbs (Atomizer, Camera,	Pessaries
Syringe, Complexion, Dental,	Rubber Corks and Chemist
Breast Pump, etc.)	Stoppers
Caps (Operating Head Caps,	Sheeting
Test Tube Caps, Ice Caps,	Spinal Ice Bags
etc.)	Sponges (Rubber)
Catheters	Sprinklers (Disinfecting,
Catheter or Pyelograph Bulb	Flower)
Outfits	Stethoscope Tubes
Cups (Oral, Abdominal,	Stopples
Complexion Cups	Syringes (Bulb and Bag)
Covers (Diaphragm, Gynec, Di-	Teething Rings
lator, Segregator, Sanitary)	Tourniquets
Crotch Tips	Tubes (Rectal, Colon, Stom-
Cutting Cups	ach, etc.)
Cushions (Obstetrical, Operat-	Tubing (Rubber)
ing, Chair, and Cold Em-	Urinals
bracing, etc.)	Water Bottles

which will be of service to rubber manufacturers—Mr. J. H. Smith, 1000 Broadway, New York, N. Y., "Compounding Ingredients."

RUBBER SAMPLES ALSO BARRED

It will be seen from the following communication, sent July 19 to members of the trade by the secretary of the Rubber Club, that the British government does not sanction the sending of samples by American manufacturers direct to neutral European countries. Samples like shipments of goods must be sent via England.

TO RUBBER MANUFACTURERS:

A number of inquiries have been addressed to this office asking whether non-merchantable samples of rubber goods could be shipped direct to neutral European countries by firms signatory to the British rubber guarantee without violating it.

As an answer to these questions, I would call your attention to the following letter written in London, July 5, by the acting secretary of the Rubber & Tin Exports Committee, the secretary of The Rubber Club of America, Inc.:

Sir.—I am directed by the Rubber & Tin Exports Committee to acknowledge the receipt of your letter of the 19th ultimo, and to state that they do not see their way to exempting samples of rubber goods from the provisions of the Rubber Bonds and Guarantees.

From the above it is clear that the British government wishes samples of rubber goods treated in the same manner as the goods themselves, i. e., shipped via United Kingdom when sent to neutral European countries.

Very truly yours, H. S. VORHIS, Secretary.

THE GERMAN RUBBER PRESS AGAIN CRITICIZES THE AMERICAN RUBBER TRADE.

LATE in March the "Gummi-Zeitung," published at Berlin in the interests of the German rubber trade, criticized with considerable severity the American rubber trade for the agreement which it had entered into with the British government under which American manufacturers agreed not to supply the enemies of Great Britain with either crude rubber or rubber manufactured goods, if the British government would lift the embargo on shipments of rubber to American ports. In the May issue of THE INDIA RUBBER WORLD, by way of answer to this German criticism, there was an editorial statement of the rubber situation in this country and the necessity that existed for acceding to the terms of the British government in order to avoid a shortage of crude rubber that would very seriously have crippled the American industry. It was the belief of the editor that the statement adequately covered the ground; but the "Gummi-Zeitung" in a recent issue again reverts to the subject, and repeats its criticisms in the following language:

REPLY TO THE INDIA RUBBER WORLD'S EDITORIAL—A GERMAN CRITICISM OF THE AMERICAN RUBBER TRADE.

Following our criticism of the American rubber industry, our American colleague, THE INDIA RUBBER WORLD, wrote as follows: (Here follows a translation of THE INDIA RUBBER WORLD'S May Editorial, entitled, "A German Criticism of the American Rubber Trade.")

In accordance with our principles we have allowed the other side to be heard. We would be glad to be in accord with our colleague but with all our good will we cannot. In the above we note an exhibition of weakness in the American industry that is not worthy of an influential body and a great nation, and which we are convinced could have been avoided. Certainly other means could have been found, particularly in view of the fact that many firms had important orders for delivery in Germany which had to be canceled. This is further confirmed by what we have just learned, namely, that the members of the firm of Salomon Brothers have been fined for violating neutrality, because they wanted to ship rubber to Germany—ostensibly because they had packed the rubber in cotton bales.

This only confirms what we said of America's subordination to England's wishes. This means that the American government, like the American rubber industry, has placed itself entirely in the service of Great Britain and her interests. They have surrendered their trade rights in favor of England. This is the greatest loss an industry could sustain and a loss against which its government should have protected it. Because we Germans would not submit to such things, they call us barbarians. But we are genuinely glad to bear this designation.



WHEN the Rubber Club holds an outing it invariably brings together a couple of hundred members of the rubber trade who have abandoned themselves to a day of sociability, sports and care-free enjoyment. That was certainly the case on Wednesday, July 14, when the Vesper Country Club was the scene of this annual function. This club owns a beautiful wooded island in the Merrimac River, just above Lowell, Massachusetts, and here a fine club house has been erected, also a number of special buildings suitable for the various sports and avocations of the members of the club, while the grounds have been turned over to the attention of landscape architects and golf and tennis experts. The result is one of the finest club premises in New England.

Thither in the morning half a hundred or so more or less expert golfers hied themselves, to take part in a golf tournament—one of the regular features of all the outings of the Rubber Club—which lasted all day long, the score not being officially settled until nearly sundown.

The non-golfers, however, waited until one o'clock, when

was served upon their arrival at the club grounds.

In order to keep the members interested, tin "kazooos" were distributed, so each could make his own music, the band program being reserved for afternoon and evening entertainment. A Kazoo octette was organized, which paraded the length of the train a few dozen times, the selections rendered including most everything from "Tipperary," "Marseillaise" and "Wacht am Rhein" (entirely neutral) to Sunday school hymns and "Dixie."

The train stopped on the bank of the river opposite the island. The connection therewith is a suspension bridge with footpath 4 feet wide. Suspension bridges of this kind proverbially wobble, but as a wobbler that particular footbridge should certainly take the prize. There was more motion to it than on a United Fruit steamer going South without cargo.

And at the end of the bridge was a turnstile. It was wide enough to let even the fattest rubber man through, but in its construction no provision had been made for the admission of a bass drum. It required the services of a bridge jumper,



MEMBERS AND GUESTS OF THE RUBBER CLUB AT THE ANNUAL OUTING.

they embarked on a special train from Boston. The ride occupied about an hour and a commodious baggage car was improvised for a buffet, to take the edge off the appetites of the excursionists, for whom a more substantial lunch

two structural steel climbers and a wader to get the bass drum to the island, but the job was finally accomplished without accident.

The march up to the club house ended for a number

two was partaken of, and then the contests for prizes in tennis, races and sports of various kinds were started. Others contented themselves comfortably in piazza chairs and swapped stories, drank cooling beverages and variously enjoyed themselves.

It was hot work—golf and tennis, quoits and shot-put. And even the water sports were none too cooling, for the water was "near warm." Wallace G. Page had charge of this feature of the outing and in spite of an ugly blow in the chin, accidentally administered by a golf club earlier in the day, he managed the canoe-tilting contest and the swimming race very efficiently, L. J. Plumb and Allen T. Weeks being the winners of the former and Weeks of the latter. The tub race was not a success. There being no available embarking point on the island landing, the 5 tubs were taken by canoe across the river, where a seemingly auspicious spot had been chosen. The canoeists disembarked, the tubs were carried toward the intended starting point, when one after another found themselves sinking to the knees in soft mud. Nothing could stand on that pick-sand, and the tubs—and the race—were abandoned.

Edwin L. Phipps had charge of the quoit contest, in which there were 32 contestants. By elimination this list was narrowed down to Miller, Quiri, Feinburg and Bennett. The play-off was between Miller and Feinburg, the latter winning.

The three-legged race was in charge of William L. Pitcher, who induced 6 couples to amble, rather at a trot, with legs strapped together, over a rather long course. G. B. Ames and John S. Clapp won by a method of perspiration which startled the spectators.

E. C. Clark interested a number of strong-armed men in the shot-putting contest, and F. M. Small secured the prize for throwing the twelve-pound sphere, his ability prompting the suggestion that he be sent across

THE INDIA RUBBER WORLD representative, but the prize winners were Wallace G. Page, best gross; C. W. Hamm, best net; C. W. Chandler, second best net. In clock golf Fred



MR. WEEKS WINNING THE SWIMMING RACE.

Howe carried off the honors and, incidentally, the handsome prize. In the driving contest Wallace G. Page again led.

Clarence H. Low not only had charge of the whole afternoon's tennis matches, but also took a hand in them, to such good effect that he landed the first prize. E. S. Dane capturing second.

But the hardest job of all was that assigned to Lloyd Appleton—securing entrants to the "cock-fight." A horizontal bar about 8 inches in diameter was fastened at a height of 6 or 8 feet,



THE CANOE-TILTING CONTEST.

and under it were placed soft mattresses. Two contestants faced each other, astride this bar, and whacked away with feather pillows until one or both lost balance and dropped to the padded area below. After much urging, some dozen or so fighters faced their opponents; then the winners fought, and again the fights narrowed down, until only Pitcher and Clark remained, and Pitcher pitched Clark off and then pitched after him, and was declared winner.

Then everybody was rounded up before the club house, with the result shown in the group picture presented herewith.

The dinner was worthy of the occasion. Tables accommodating a dozen or twenty were placed the whole length of front and side piazzas. Every man was supplied with an artistic hat or cap, which he was compelled to wear. There were more than 57 varieties, and the official photographer regrets that the night was too dark to allow for picture-taking.

The menu was unique. It was an idea of F. F. Schaffer and a contribution by the Goodyear's India Rubber Glove Manufacturing Co. for the occasion. It was noticed when the company was seated that there were no bills of fare, but soon there were distributed neat, plaid-covered boxes. On opening, each box was found to contain a handsome hot water bottle, about the size of a man's hand. Investigation showed that



THEY TOOK THE TUBS ACROSS THE RIVER IN A CANOE.

the water to project hand-grenades into the trenches.

Mr. Hopkins had his hands full arranging the golf tournament, and the sports of the cards was not secured by

the menu was engraved on the red rubber, together with the date and the name of the club. It was a bright idea, cleverly carried out, and certainly appreciated.

The menu read as follows:

THE RUBBER CLUB OF AMERICA, INC.

MENU.

Cocktail
Clam Broth
Steamed Clams
Olives
Broiled Live Lobster
Saratoga Claps
Rashies
Cigars
Champagne
Cigarettes
Grilled Half Spring Chicken
French Fried Potatoes
New Green Peas
Green Corn
Frozen Pudding
Respectful Cheese
Toasted Salmes
Cocoa

VESPER COUNTRY CLUB,
Lowell, Massachusetts,
July 14, 1915.

Rubber balloons of various colors, each lettered with the name of the club, were tossed and batted from table to table, until the too rough usage caused punctures and explosions.

The dinner was enlivened by music, the Cadet Band being responsible for the instrumental and the Lotus Quartet for the vocal selections, while many impromptu solos, duets, trios and choruses were the voluntary contributions of the diners.

As usual, the prizes were distributed during the dinner, and also there was an absence of speeches, prandial or post-prandial. Good fellowship reigned and the whole affair was strictly informal.

And when all had eaten and drunk their fill it was time to take the special train at the other end of the undulating bridge. Again the big helicon and the bass drum were carried around the turnstile. An hour later the company separated at the North Station in Boston.

Great credit must be given the members of the Outing Committee—P. E. Young, of the Acushnet Process Co.; Robert L.



CLUB HOUSE OF THE VESPER CLUB, WITH TENNIS COURTS IN FOREGROUND.

Rice, of the Hood Rubber Co., and F. H. Appleton, Jr., of F. H. Appleton & Son., Inc. Mr. Young had charge of the transportation, Mr. Rice of the dinner, and Mr. Appleton of the sports. The gentlemen in charge of the various features and contests, whose names are mentioned earlier in the report, are also entitled to praise and the thanks of the association for their good work.

Should be on every rubber man's desk—Crude Rubber and Compounding Ingredients; Rubber Country of the Amazon; Rubber Trade Directory of the World.

UNITED STATES CONSUL REPORTS ON HOLLAND'S RUBBER TRADE.

United States Consul D. I. Murphy, stationed at Amsterdam, Holland, in his report of April 10, has the following to say of the rubber industry of that country:

"In the early part of 1914 demand for rubber, especially the cultivated product of the East Indian plantations, was keen.

"The following table shows the stock of rubber on hand January 1, 1914, the amount imported during the year, the extent of the sales, and the stocks unsold on December 31. The quantities are given in half kilos of 1.1 pounds each

	Hevea, Half kilos.	Plantation Ficus, Half kilos.	Castilla, Half kilos.	Ceara, Half kilos.	Forest Ficus, Half kilos.	Various Forest Rubbers, Half kilos.	Total, Half kilos.
Stock Jan. 1,							
1914	88,448	8,090	744	1,000	6,767	6,665	105,714
Imports in 1914	1,184,181	109,014	23,213	6,738	—	—	1,334,121
Exports in 1914	1,127,669	117,104	23,967	7,348	7,790	6,775	1,334,323
Stock Dec. 31,							
1914	40,672	65,888	22,087	7,348	7,790	6,775	170,870
Stock Dec. 31,							
1913	31,957	51,216	1,280	—	—	—	84,453

"The 1913 import consisted of 1,039,500 half kilos, of which 839,500 were *Hevea*, 121,000 plantation *Ficus*, 23,000 *Castilla*, 500 *Ceara*, 30,000 forest *Ficus*, and 21,000 various forest rubbers. From which it will appear that the 1914 import exceeded that of the year previous by 294,621 half kilos.

"At the first 1914 auction in January prime *Hevea* brought 1.57½ florins per half kilo (\$0.63 per 1.1 pounds). Prices advanced to 1.76 florins in April, falling to 1.47 florins at the end of July. During the last five months of the year, prices fluctuated considerably.

"The pressing need for rubber by the contending powers soon made itself felt, brisk and incessant demand being evident. Unfortunately, however, the importation of rubber became practically impossible, cargoes consigned to Amsterdam being seized en route and unloaded in the ports of one of the warring nations. In the last part of the year the best price for prime *Hevea* was 2 florins per half kilo (\$0.80 per 1.1 pounds). Private stocks were entirely disposed of, what rubber remained unsold December 31 being retained by the government. Two important factories in this consular district, one at Amsterdam and the other at Haarlem, manufacture rubber driving belts, tubing, railway buffers, plugs and linings, and recently have had pronounced success in making ebonite, or hardened rubber. The product of these concerns, made from the raw rubber of the East Indies, is largely exported to the Dutch colonies, Belgium, Great Britain and Africa."

AMERICAN RUBBER GOODS IN DOMINICAN REPUBLIC.

The total imports of rubber goods into the Dominican Republic amounted in 1914 to \$27,091, of which \$22,441, or 82 per cent, was furnished by the United States. During the previous year imports from the United States amounted to \$27,309, or over 87 per cent. of the total imports of rubber goods, which were valued at \$31,032.

The Goodyear Tire & Rubber Co., Akron, Ohio, is issuing to users of Goodyear tires two very useful slide rule scales. One is designated as the "Goodyear Inflation and Load Scale," and the other the "Goodyear Calculator for Pneumatic Tires."

The first instrument shows the best average load, with its corresponding inflation pressure, for any given tire section. The second instrument has a double set of scales. One set will enable the tire user to determine the possibilities or durability of the tires in use and the effect of an increase of size; the other set of scales enables one to determine per cent. changes of cushioning qualities of a tire corresponding with the pressure necessary to produce it, and also the effect of increase in size of tire section on cushioning.

THE UNITED STATES RUBBER CO.'S DIVIDENDS.

At a meeting of the board of directors of the United States Rubber Co., held July 1, a quarterly dividend of 2 per cent. was declared on the first preferred stock and a quarterly dividend of 1 per cent. on the second preferred stock, payable July 31 to stockholders of record at 3 P. M., July 15.

There had been considerable speculation in financial circles as to what action the company would take regarding dividends on its common stock. This matter was taken up at that meeting by President Samuel P. Colt, who made the following suggestion:

"I have thought it might be helpful to outline to the board of directors the following points bearing upon the payment of dividends upon the stocks of our company at the present time:

"1. I assume there will be no question as to the payment of the regular dividends upon the preferred stocks and that the only doubt in the minds of the directors will be as to the advisability of paying a dividend at this time upon the common stock.

"2. At the meeting of our board immediately following the outbreak of the European war, it was quite evident that a number of our directors were averse to the then payment of the common stock dividend and that the then hope of an early termination of the war stress of financial conditions then existing and motives of patriotism influenced their action in favor of a dividend. The feeling of conservatism on the part of the board then begun has continued to increase until it would seem that a considerable number of directors are now opposed to the present declaration of a common stock dividend.

"3. In 1901, when your present president was first elected, the company was not paying dividends on either the preferred or common stocks. In 1904 dividends were resumed on the preferred stock and have since been continued regularly. In 1911, after considerable pressure on the part of common stockholders, dividends at the rate of 4 per cent. per annum were begun upon the common stock and continued at that rate until April, 1913, when the rate was increased to 6 per cent. per annum. This increase was made largely in order to effect the purchase of the Rubber Regenerating Co., which company was paid for by the issue of \$6,000,000 of the common stock of the United States Rubber Co.

"4. In the last annual report of the president to the stockholders, dated March 4, 1915, appears the following:

"THE OUTLOOK."

"While at the moment there is nothing discouraging in relation to our business, your president feels that the year 1915 is one of uncertainty; and it may be considered good fortune if we are able to maintain or to increase our volume of sales and profits as compared with last year. When the uncertainties caused by the war shall have ceased, when we shall receive a substantial part of our crude rubber from our Sumatra plantations, and when we shall have realized our anticipations from our development and operating departments, we fully expect to enjoy prosperity greater than we have heretofore known."

"That report further shows that the surplus profits of the company for the year 1914 were \$721,950.79 over dividends paid on the preferred and common stocks during the year. It further shows that \$4,850,000 was expended during the year in fixed properties, including the rubber plantations in Sumatra, which sum, less surplus of earnings, was taken from the quick capital of our company.

"5. The net earnings of the company so far this year are substantially the same as those of last year, and as a rule the earnings of the latter half of the year exceed those of the first half. The unexpected prolongation and extension of the European war have presented uncertainties which it may be urged make it now especially desirable to maintain an unusually strong financial position. The pendency of the war makes it prudent to carry a larger stock of crude rubber than in normal times, involving the use of a larger amount of quick capital.

"6. The outstanding common stock being \$36,000,000, 6 per cent. dividends thereon amount to \$2,160,000 per annum. It is undoubtedly desirable that current bank loans should be reduced in volume. The lower price of crude rubber, resulting from its cultivation in the East, opens up new lines of manufacture, in the development of which capital is specially desirable. Should the directors determine to suspend common stock dividends for

a time, the company will undoubtedly be greatly strengthened thereby and it is not unreasonable to believe that such action in the end will prove more advantageous to our common stockholders and profit sharers than the present distribution of cash.

"7. While competition in the rubber manufacturing business promises to be keen in the future, your president looks to see the United States Rubber Co. continue a prosperous business, and with the coming into bearing of our rubber plantations in Sumatra, from which we will in the not distant future receive at its production cost a substantial amount of our crude rubber requirements, we may reasonably look for greater profits than heretofore realized."

The board of directors on hearing the president's suggestion as to the dividend on the common stock took the following action:

"The directors of the United States Rubber Co., having heard the suggestions of the president in regard to the payment of a dividend on the common stock at this time, and having fully considered the question, are unanimously of the opinion that the excess of earnings over dividend requirements is too small to warrant the payment of this dividend at this time in view of the amount of the company's floating indebtedness, the additional capital required to develop new lines of business, and the uncertain conditions arising from the European war. In their view a sound and conservative business policy requires that the money necessary to pay a dividend on the common stock should at this time be used to reduce the floating debt and to increase the working capital; and they believe that this action will strengthen the position of the company, and, in the end increase the value of both the common and preferred stocks."

TRADE NEWS NOTES.

The directors of the New Jersey Zinc Co. voted unanimously on July 7 to increase the capital of the company from \$10,000,000 to \$35,000,000 by declaring a 250 per cent. stock dividend. The war has developed such an increased demand for zinc that the zinc mines are being worked overtime to meet it.

The Montreal division of the Canadian Consolidated Rubber Co., Limited, has recently filled orders for suction hose, pneumatic tool hose and hip and knee boots for use by the C. P. R. Overseas Engineering force in France. This force is composed of construction engineers and workmen, who will assist in bridge building, road making, etc., in the war area.

The Rubber & Celluloid Harness Trimming Co., which controls the Rubberset Co., of Newark, New Jersey, is suing the F. W. Devoe & C. T. Reynolds Co., of New York, for alleged unfair competition in the sale of brushes. The action involves the use of the terms "rubberset" and "set in rubber."

The Goodyear Tire & Rubber Co., Akron, Ohio, has inaugurated a stock system for dealers, enabling them to quickly determine what tires are in stock. The system employs tags in five colors for no-rim-cut tires, quick detachable clincher, regular clincher, tubes and miscellaneous. Each tag has an attached coupon which, after being properly marked, is torn off and kept for a desk record, while the stub is fastened to the tire in the stock room. Blank division cards are also provided for use by the dealer in making his own index for this system.

In the suit for infringement under patent No. 799,662, September 19, 1905, brought by the Allen Auto Specialties Co., New York, against E. G. Baker, in the United States District Court for the Southern District of New York, for offering for sale and handling the Gilbert tire case embodying the water-shed flap, Judge Hand has issued a decree in favor of the Allen company, enjoining Baker from selling this Gilbert type of cover.

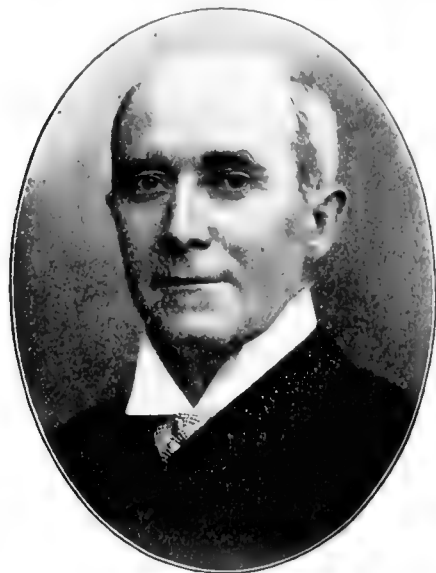
The St. Mungo Manufacturing Co., of Newark, New Jersey, which makes the "Colonel" golf ball, has opened offices in the North American Building in Chicago, and in the Lachman Building, in San Francisco.

The Standard Underground Cable Co., of Pittsburgh, Pennsylvania, has issued a condensed catalog of its ignition, lighting and starting cables for automobiles, motor boats and motorcycles. Twenty different types are illustrated and described.

The Obituary Record.

WILLIAM M. IVINS.

WILLIAM MILLS IVINS, formerly president of the General Rubber Co. but more widely known as a brilliant member of the bar, and a conspicuous figure in New York politics, died at his home, 145 West Fifty-eighth street, New York, July 23, from acute Bright's disease result-



WILLIAM M. IVINS.

ing from the exhaustion which followed the long strain of the Barnes libel suit against Col. Roosevelt, in which Mr. Ivins was the leading counsel for the plaintiff.

Mr. Ivins was born in Freehold, New Jersey, in 1851, but lived practically all his life in Brooklyn. He graduated from the Adelphi Academy in that city and studied law at Columbia Law School, from which he took his degree in 1873.

Three years later, when only 25 years of age, he showed his mettle by leading a successful attack against the political "boss" of his home city. He displayed at that time such remarkable skill in exposing municipal abuses that he was called upon many times in later life to assist in effecting state and city government reforms.

In 1881 he became the private secretary of William R. Grace, then Mayor of New York, and in this way formed an association which later led him into prominence in the rubber field. When Mr. Grace was re-elected Mayor, in '84, he appointed Mr. Ivins City Chamberlain, a position which he held for four years with marked distinction. In the meantime he had become associated with Mr. Grace in various South American matters, becoming in this way interested in the rubber industry. So well known did he become in the southern continent that in 1892, when Brazil and Argentina became involved in a dispute over boundary lines, Mr. Ivins was asked by the Brazilian government to represent its interests, which he did with great success. When the Rubber Goods Manufacturing Co. was formed, in 1899, he assisted actively in its organization and during its earlier years was one of its directors. And when the General Rubber Co. was formed, in 1904, for the purpose of establishing a wide commercial system for supplying the United States Rubber Co. with its imports of crude rubber, he became president of the company. In November of that year he was one of the party taken by Commodore Benedict on the steam yacht "Virginia" for a three months' cruise up the Amazon as far as Manaos—undertaken chiefly for the purpose of studying the crude rubber situation.

In the fall of 1905 the Republicans of New York City made Mr. Ivins their candidate for the mayoralty. It was a three-cornered contest in which his two rivals were William R. Hearst and George B. McClellan. While Mr. Ivins did not succeed in winning the mayoralty, he succeeded in making

that campaign one of the liveliest and most interesting municipal campaigns on record. In May of the following year—1906—he resigned as president of the General Rubber Co., owing to pressure of his legal work and other interests, and after that time took no active part in the rubber industry, although he planned to write an exhaustive work embracing the whole realm of rubber, a subject with which he had made himself widely familiar. The many demands on his time, however, made it impossible for him to carry out this project.

It would be impossible in the brief space available on this page to recount the commercial enterprises, official investigations and celebrated legal controversies in which Mr. Ivins took part. The last notable law suit in which he was engaged, referred to above—in which he represented Mr. Barnes against Col. Roosevelt—is too recent a matter of political history to need any extended reference. The tremendous volume of work which he did in connection with the suit, and the great energy that he threw into it, undoubtedly brought on the general physical collapse which terminated fatally.

Mr. Ivins was a man of extraordinary intellectuality, with a great diversity of gifts. He took a keen enjoyment in mastering languages, and spoke five or six with easy fluency. He was much devoted, also, to the science of botany, and was an enthusiastic collector of objects of historic interest. He was a man of marked individuality and left a notable record as a lawyer, orator, scholar and business administrator.

R. H. LOCK.

Dr. Robert Heath Lock, author of "Rubber and Rubber Planting," editor of the "Tropical Agriculturist," and formerly assistant director of the Botanical Gardens, Ceylon, died suddenly, June 26, at Eastbourne, England. Dr. Lock was 36 years of age. He was born at Eton College, where his father, Rev. J. B. Lock, was assistant master, and was educated at Cambridge University. In addition to his literary work he acted as curator of Cambridge University Herbarium for 3 years, and conducted for 4 years continuous experiments in rubber tapping. Dr. Lock, in "Rubber and Rubber Planting"—reviewed in these columns February, 1914—combined a treatise on the science of rubber planting with general information in such a way as to make the book interesting to the general reader as well as to the rubber expert. By his death tropical agriculture is deprived of the services of one specially fitted to advance its interest.

JOHN N. WILLIAMS.

John Newton Williams, connected for over 40 years with the Boston Rubber Shoe Co., and the father of Elisha S. Williams, president of the Rubber Goods Manufacturing Co., died from neuralgia of the heart July 2 at his summer home in Falmouth, Maine. Mr. Williams was born in Woodstock, Connecticut, March 31, 1849. He was a nephew of Mrs. Elisha S. Converse, and after finishing his course at the local school he joined the forces of the Boston Rubber Shoe Co., first being connected with its store in Boston and being transferred a few years later to the factory at Malden. There he had charge of the shipping department for nearly 35 years, retiring eight years ago.

During his employment at the factory in Malden he made his home in that city, but soon after his retirement moved to Brookline, Massachusetts. He was married in December, 1870, to Miss Caroline Bickford, who survives him. Besides Elisha S. Williams, there are three other surviving children, Frank C. Williams of Kansas City, Mrs. William D. Locherty of Malden and Mrs. S. C. W. Simpson of Brookline.

WILLIAM H. SMITH.

William H. Smith, who for twenty years was connected with the Manhattan Rubber Manufacturing Co., of Passaic, New Jersey, died June 30, after a long illness, at his home in that city, at the age of 66 years. He joined the Manhattan company in October, 1894, and had charge of its calender room until he was retired on a pension in October, 1913. His wife survives him.

JOHN L. MOTHERSHEAD.

John Leland Mothershead, for many years associated with The Grasselli Chemical Co., died suddenly at his home in Cleveland, Ohio, July 16.

Mr. Mothershead came from a family of Kentucky pioneers. He early moved to Indianapolis, where he was prominent in business and politics. Previous to his connection with The Grasselli Chemical Co., he was engaged in the manufacture of Silicate of Soda at Fortville, Indiana. Mr. Mothershead was well known throughout the chemical trade. He was a Knight Templar and a Thirty-second Degree Mason. He is survived by his wife, a daughter and two sons. The interment took place at Indianapolis.

JAMES MACQUAID.

James MacQuaid, for many years treasurer of the National Conduit & Cable Co., of New York, died of heart disease, July 10, at his home in Twickenham, London, after an illness of several months. Mr. MacQuaid, with two partners, founded the Conduit company over a quarter of a century ago and he was very active in its affairs until his retirement ten years ago. Since that time he has made his home, for the most part, in England. He purchased the historic place at Twickenham known as "Pope's Villa" from the fact that it was in this house that Alexander Pope wrote the "Essay on Man" and other famous poems nearly 200 years ago.

ORIGIN OF RUBBER FOAM.

THE origin of rubber foam or rubber froth, as it is sometimes called, has been much discussed and it may be interesting to state a few facts concerning this discovery.

Rubber foam was first patented in Germany, on August 10,

cember 30, 1913. Practically all the properties of rubber foam known today were enumerated in these letters patent.

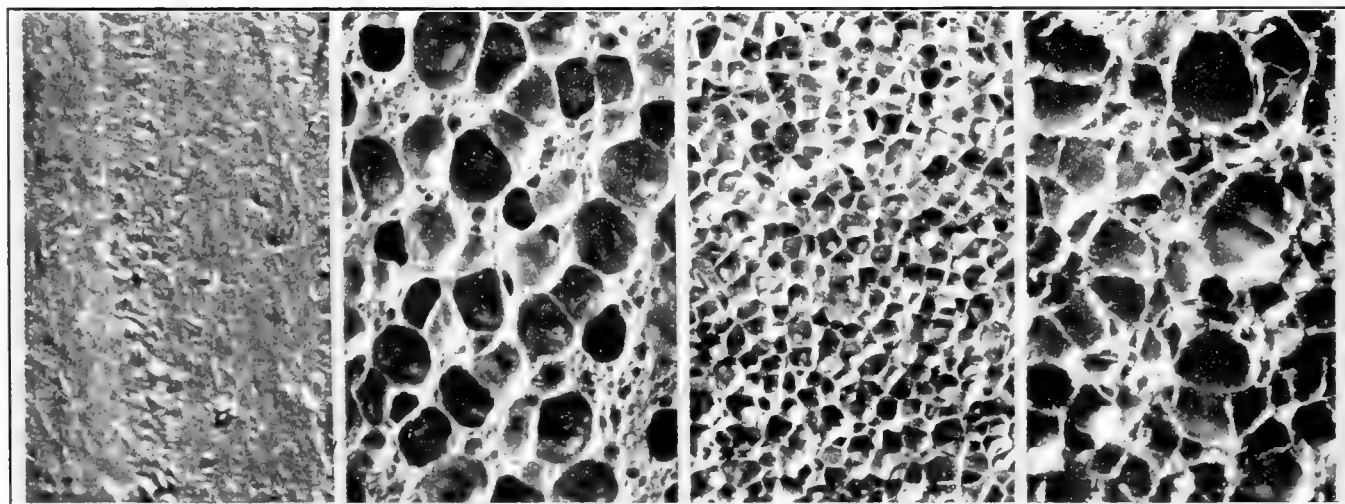
The manufacture of rubber foam is based upon the observation that rubber as well as gutta percha and balata are not homogeneous or impenetrable substances, but represent a microscopic reticular structure into which gas can penetrate and remain under certain conditions. Rubber foam can be produced either in the form of soft rubber or in the form of hard rubber.

To make soft rubber foam, rubber is subjected in an autoclave to the high pressure (80 to 300 atmospheres) of an optional gas and is vulcanized. Under the high pressure the gas penetrates the rubber so that when vulcanization is sufficient and the gas pressure removed the rubber thus treated swells into a foam-like mass the volume of which is from 13 to 18 times that of the original rubber before treatment. This foam-like mass is made up of a multitude of closed cells, each of which contains, under pressure, a portion of the gas that was forced into the rubber during the vulcanization. The size of these cells and the pressure of the gas they contain can be varied indefinitely by manipulations of the manufacturing process. For making hard rubber foam the process is continued by placing the soft rubber foam in iron retorts and subjecting it to heat and pressure, continuing the vulcanization until the desired degree of hardness is obtained. The shape and conformation may also be equally varied.

It is very light (about 100 pounds per cubic yard of volume), is both gas and water-proof and affected only by strong acids. The cost of production varies with the price of crude rubber, and is rather higher than the final cost of good soft or hard rubber. It must, however, be borne in mind that 1 pound of rubber foam has the same volume as 18 pounds of solid rubber.

A variety of practical applications is claimed for rubber foam due to its bulk and cellular structure. The list includes its use as a substitute for cork in life belts; filling for pneumatic tires and playing balls, imparting resiliency regardless of punctures; insulation of heat and cold in clothing for autoists and aviators and in walls of refrigerators; also for upholstery and other cushioning purposes.

While not affected by acids generally, rubber foam will dissolve in ammonia, which can be used to soften hard foam to



RUBBER FOAM STOCK BEFORE
VULCANIZATION.

SOFT RUBBER FOAM WITH
LARGE CELLS.

SOFT RUBBER FOAM WITH
SMALL CELLS.

HARD RUBBER
FOAM.

1910, by Fritz Pfeumer, an Austrian engineer residing in Dresden, Saxony. A United States patent (No. 1,038,950) was granted to Mr. Pfeumer for his invention of rubber foam on September 17, 1912, and reissued (No. 13,667) De-

facilitate working it. When the ammonia is evaporated hard foam regains its original hardness. It is said to be susceptible of fireproofing and is soon to be produced commercially at the rubber works in Elkhart, Indiana.

Annual Meeting, American Society for Testing Materials.

THE annual meeting of the American Society for Testing Materials was held at Atlantic City from June 22 to 26, with a registered attendance of over 500 engineers and chemists representing the industries of rubber, metals, ceramics, coaltar, paints, fuels, lubricants and textiles. One of the noteworthy features of this meeting was the increasing interest shown in the so-called organic industries and the materials produced wholly or in part from organic products. At the first meetings of the society, held fifteen years ago, little or no mention was made of such subjects as coaltar products, rubber, lubricants and textiles, while at the meeting just closed fully one-third of the delegates were directly interested in a discussion of these topics, either as producers or as consumers.

Among the rubber interests represented in the society are Gutta Percha & Rubber, Limited, and the Dunlop Tire & Rubber Co., Limited, both of Toronto, Canada; The B. F. Goodrich Co., the Manhattan Rubber Manufacturing Co., the Hodgman Rubber Co., and the Goodyear Tire & Rubber Co.

The following rubber chemists are also members of the society: J. M. Bierer, of the Boston Woven Hose & Rubber Co.; Roscoe M. Gage of the Fisk Rubber Co., and Frederic Dannerth, consulting chemist, who represents the rubber goods manufacturing interests in a general way.

Among the consumers of rubber goods represented in the society are a number of the leading railroads of the country, including the Pennsylvania; New York Central; Delaware, Lackawanna & Western; New York, New Haven & Hartford; Northern Pacific; Union Pacific; Chicago, Burlington & Quincy; the Reading and Atchison.

Unfortunately for the manufacturers of mechanical rubber goods, they have a very small representation in the sub-committees in charge of preparing specifications. As there are at present only a few manufacturers enrolled as members of the society, the framing of specifications is done largely by the consumers, the railway interests.

Committee D-11 on Standard Specifications for Rubber Products (E. A. Barrier, chairman) prepared for the society a specification for Cotton Rubber-lined Fire Hose (described below), and another for Rubber Covered Wire. A specification for rubber belting for power transmission is being prepared by the Sub-committee on Belting and a specification for Air-Brake Hose is being prepared by another sub-committee in conjunction with the committee of the Master Car Builders' Association.

At the meeting just held in Atlantic City, two new sub-committees of the Rubber Committee were organized, one on Standard Methods of Testing and another on Standard Definitions and Nomenclature of Crude Rubber Varieties, of which Frederic Dannerth is chairman. The chairman of the other sub-committees are as follows: Air Hose, E. B. Tilt of the Canadian Pacific Railroad; Belting, W. E. Campbell, chief chemist of Gutta Percha & Rubber, Limited, Toronto; Cold Water Hose, E. A. Barrier of the Factory Mutual Laboratories; Insulated Wire, C. D. Young of the Pennsylvania Railroad; Packing, E. S. Land of the United States Bureau of Construction and Repair; Steam Hose, J. B. Young of the Reading Railroad.

At the general meeting of the society a resolution was offered to the following effect: "No specification shall contain any discrimination between two or more materials unless such specification contains a method of distinguishing these materials."

In explanation of this resolution it was stated that the use of such terms as *Pará* Rubber, *Plantation* Rubber, *Hevea* Rubber and the like was undesirable, as it was impossible to tell the source of a rubber after it had been made up into a finished product. It was contended that it was more important that the

product should comply with certain physical or chemical tests. In view of this it would be thrusting too much responsibility on the manufacturer to compel him to put a certain botanical variety of rubber in his goods.

Another matter of special interest for rubber goods manufacturers was the organization of a Committee on Textile Fabrics, with W. D. Hartsborne, of Methuen, Massachusetts, as chairman, and D. E. Douty of the New York Conditioning Laboratory, as secretary. The sub-committee on automobile tire fabrics has already devised a method for testing this material, and a sub-committee on duck for belting and hose has been appointed. In view of the fact that there are at this date no officially recognized methods for testing textile cotton fabrics, rubber goods manufacturers will look forward with a great deal of interest to the work of these sub-committees. The work will consist, first, in devising standard methods of testing, and second, in preparing standard specifications for duck for tires, hose and belting.

TESTING RUBBER IN RUBBER-LINED HOSE.

PROPOSED standard methods of test for rubber in rubber-lined hose recommended by Committee D-11 of the American Society for Testing Materials, have been referred to the society for adoption by letter ballot.

They specify the usual precautions regarding sampling and preparation of reagents for analysis, and give in detail the methods for acetone extraction, free sulphur, alcoholic-potash extract, total sulphur and ash. Rubber is determined by difference between 100 and the sum of the total sulphur and ash expressed as percentages figured on the total compound. In case the alcoholic-potash extract is over 2 per cent. of the rubber as first calculated, this excess is also subtracted from the rubber. The organic-acetone extract is obtained by taking the difference between the total acetone extract and the free sulphur. The organic-acetone extract, free sulphur, total sulphur and alcoholic-potash extract are figured on the amount of rubber, found as above.

For physical testing 3 test pieces are cut, transversely of the

hose, and tested between 65 and 90 degrees Fahrenheit. The test pieces are cut by die of shape and dimensions shown

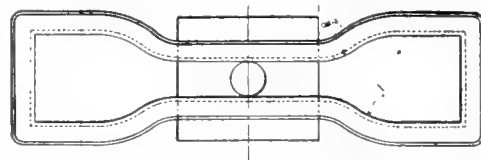


FIG. 1. DIE.

in Fig. 1. Test pieces must be buffed to remove adhering cement coating before the test, using for this purpose a power grinder.

Tensile strength tests are to be made on apparatus conforming in general design to the "Schopper" machine. The grips must tighten automatically and exert a uniform pressure the full width of the test piece proportionate to the applied tension, jaws to separate at rate of 20 inches per minute. A spring micrometer gage, accurate to within 0.001 inch and having a circular foot 0.4-inch in diameter must be used for measuring. Elongation is to be measured on 2-inch marks placed on sample before test, the marks to be followed under test with a rule reading by 1/16 inches. Set is to be determined on an unstretched piece. Marks 2 inches apart are held stretched to a specified distance for 10 minutes, then released, and the set measured after rest of 10 minutes. Tensile tests are repeated if break occurs outside the gage marks on test piece.

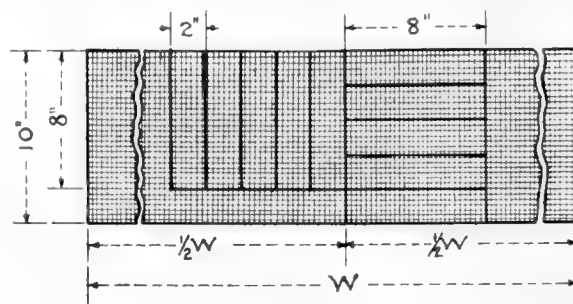
Hydraulic pressure test of hose for bursting or proof is specified as follows:

... of a straight hose on a plane surface in a straight line or on a curved line or pump and filled with water. The hose is then closed and a pressure of 100 pounds per square inch applied. The test shall be made on the original measurements. Pressures are measured by a standard gage.

The increase of pressure shall be made at a rate of 300 pounds per minute. While making the elongation and twist measurements the hose shall be held at specified pressure for not more than two minutes. In the bursting test, in the curved position the apparatus shown in Fig. 2 shall be used. The kinked test shall be made on 3-foot samples with the ends tied together and

plied by the percentage of moisture, by test, divided by 100.

(9) The width of roll shall be determined as the average at 5 places uniformly distributed along length of roll. (10)



LOCATION OF TEST SPECIMENS.

Length of roll shall be determined by registered yardage over a measuring drum of known circumference. Uniform tension, suggested for this measurement, to be 2.5 times the weight of 5 running yards of the fabric.

STORAGE BATTERY TRUCKS FOR FACTORIES.

The aim of the factory manager is to eliminate all lost motion, thus increasing the output and decreasing cost. In a great many industrial plants half-finished and finished product must be transferred from one department to another and this work is done largely by means of hand trucks handled by a crew of men.

Examination of the internal transportation facilities of a plant will often disclose the lack of economy in the elevator service—



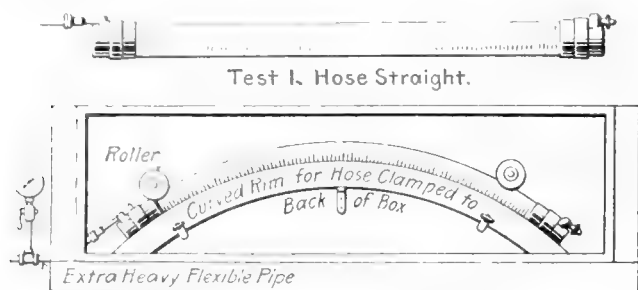
sometimes it is badly congested and at other times lying idle. As trucks with storage batteries will take easily a 15 or 20 per cent. gradient on inclined planes between floors, they are advised, thus saving delay, interest, depreciation and operating expense of elevator machinery.

In all the plants where these conditions prevail, storage battery trucks pay a handsome annual return on the money invested. The illustration shows the latest type of rubber shod truck. [Edison Storage Battery Co., Orange, New Jersey.]

RUBBER EMBARGOES.

The Union of South Africa has recently placed an embargo on exportations to all destinations other than the United Kingdom, British Possessions and Protectorates, of rubber (including crude, waste and reclaimed, rubber solutions, solutions containing rubber, jellies containing rubber and any other preparation containing rubber) and goods made wholly or in part of rubber, including tires.

The Governments of the Federated Malay States and British Honduras, the Canadian Customs Department and the Commonwealth of Australia have all announced similar embargoes.



Test 1. Hose Straight.

Test 2. Hose Curved on Radius of $2\frac{1}{4}$ Feet

Test 3. Hose Kinked, Ends Tied Together.

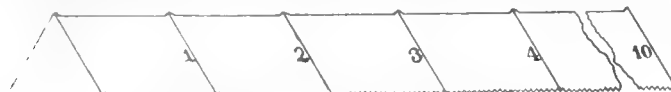
FIG. 2. APPARATUS FOR PRESSURE TEST.

the couplings touching with a sharp kink in the middle of the hose; or if made on a 50-foot sample the hose shall be tied together at a point 18 inches from where the kink occurs.

TESTING TIRE FABRICS.

AT the recent meeting the Committee on Standard Tests and Specifications for Textile Materials reported tentative methods. This report was amended and accepted for publication for one year in the Year Book of the Society, subject to further action a year hence.

In outline the methods relate to the following matters: (1) Sampling a 10-inch swatch from either end. (2) Test specimens to be cut 8 inches long by 12 inches wide, raveled each side to required width, using a count scale (see figure). (3) Test samples to be oven dried (221 degs. to 230 degs. Fahrenheit) to constant weight; the breaking stress to be obtained within 30 seconds from removal from oven; the length of specimen between jaws to be 3 inches, moving jaw to travel uniform rate of 12 inches per minute. (4) Elongation measured, on reference marks 3 inches apart, at instant



COUNT SCALE FOR TESTING FABRICS.

of breaking. (5) Weight per square yard shall be based upon the dimensions of a complete roll expressed as dry weight, or standard weight. The latter is the dry weight increased by a standard moisture allowance of 85 per cent. (6) Moisture test samples are taken from both ends of roll while dry weight and weight of roll are determined separately. (7) Samples for moisture, weighing 100 grams, are oven dried and weighed in air-tight containers. (8) The dry weight of the roll is determined by weighing that weight multi-

News of the American Rubber Trade.

THE HODGMAN COMPANY'S NEW OFFICE BUILDING.

THE new four-story reinforced concrete office building which the Hodgman Rubber Co. is erecting at Tuckahoe, New York, is well under way, and it is expected will be ready for occupancy by December first. It is the purpose of the company to move its main office to Tuckahoe about the first of next year, so that all departments will be under one roof, but it is the intention to retain a New York office and sales room for the convenience of the trade.

THE U. S. RUBBER RECLAIMING CO. INCREASES FACILITIES.

The U. S. Rubber Reclaiming Co. has purchased a large tract of land adjoining its present property at Buffalo to provide for an increase of present warehouse facilities. The company proposes at an early date to erect storehouses with a capacity of 10,000 tons of scrap rubber.

This company will also take over and operate the plant of the Derby Rubber Co., at Shelton, Connecticut, on August 1. The large and increasing demand for reclaimed rubber suitable for insulated wire has necessitated this increase of facilities.

THE KING RUBBER CO.

In spite of the disastrous fire that occurred at the works of the King Rubber Co., Hyde Park, Boston, June 4, the company was manufacturing goods again June 20. The report that several gasoline tanks exploded in the works at the time of the fire was incorrect. There were no explosions whatever. The company intends to erect a new factory building which will be ready for use early in September.

RUBBER TRADE INQUIRIES.

[108] A large foreign rubber manufacturing concern which uses regularly up to 30 tons of carbonate of magnesia (basic precipitate) monthly, has requested through The India Rubber World names of American dealers in a position to supply this material in quantities.

[109] An inquiry has been received at this office for names of manufacturers of rubber jokes, especially hatchets and razors.

[110] Another inquirer desires the names of manufacturers of molds for turning out rubber hatchets, daggers, razors and tacks.

[111] A prominent European rubber manufacturing firm wishes quotations on various chemicals and compounding ingredients, including benzol, lampblack, litharge, lithopone, magnesia (carbonate and calcined), naphtha, resin oil, sulphur chloride and flowers, zinc oxide and sulphide and sulphuret of antimony, crimson and golden.

TRADE OPPORTUNITIES FROM CONSULAR REPORTS.

A firm in England desires communication with manufacturers and exporters of vulcanite fittings for douches and syringes. Report No. 17,590.

A merchant in Spain wishes to receive offers on rubber bands for covering copper wire, similar to samples which may be examined at the Bureau of Foreign and Domestic Commerce at Washington or its branches.

Sealed proposals will be received at the office of the Light-house Inspector, Buffalo, New York, for approximately 6,900 feet of submarine electric cable. Schedule No. 2503.

A firm in Argentina desires to receive quotations and full information relative to rubber heels, etc. Report No. 17,637.

An American consular officer in Brazil reports the name and address of a firm which desires to sell about 70 tons of gray Manicoba rubber. References are given. Report No. 17,464.

ANOTHER VIOLATION OF THE RUBBER AGREEMENT

Eighteen July six crates containing fifty art. tires were shipped by one of the smaller international firms to Amsterdam, Holland, consigned to the Netherlands Overseas Trust Co. The British government at once blackballed the firm manufacturer and his permit to buy plantation rubber was cancelled.

UNITED STATES TIRE CO. REPORT.

The United States Tire Co., incorporated under the laws of New York, has filed with the Massachusetts Secretary of State a statement of its financial condition as of March 4, 1915. The following is a comparison of this report with that of the previous year:

Assets	1915.	1914.
Real estate, machinery and equipment..	\$387,475	.....
Real estate and investments .....	.....	\$91,53
Merchandise, etc.	3,415,522	6,192,380
Manufactured merchandise, material and stock in process	2,651,798	5,475,129
Trade marks, patent rights and miscellaneous assets	560,106	.....
Total	\$7,020,902	\$11,759,462
Liabilities		
Capital stock	\$500,000	\$500,000
Accounts payable	6,417,162	11,158,978
Surplus	103,740	100,484
Total	\$7,020,902	\$11,759,462

RUBBER COMPANY SHARE QUOTATIONS.

The following market quotations of the shares of rubber manufacturing companies on July 24 last are furnished by John Burnham & Co., 31 Nassau street, New York, and 41 South La Salle street, Chicago:

	Bid.	Asked.
Ajax-Grieb Rubber Co., common	300	..
Ajax-Grieb Rubber Co., preferred	100	..
Firestone Tire & Rubber Co., common	506	512
Firestone Tire & Rubber Co., preferred	109	111
The B. F. Goodrich Co., common	50	51
The B. F. Goodrich Co., preferred	104 1/2	106
Goodyear Tire & Rubber Co., common	269	272
Goodyear Tire & Rubber Co., preferred	105	106 1/2
Kelly Springfield Tire Co., common	165	168
Kelly Springfield Tire Co., 1st preferred	86	87
Kelly Springfield Tire Co., 2d preferred	160	170
Miller Rubber Co., common	196	199
Miller Rubber Co., preferred	94	96
Portage Rubber Co., common	36	38 1/2
Portage Rubber Co., preferred	92	95
Swinehart Tire & Rubber Co.	77	78
United States Rubber Co., common	43 1/2	45
United States Rubber Co., preferred	102	104

RUBBER COMPANY DIVIDENDS.

The American Chicle Co., of New York, paid on July 20 a monthly dividend of 1 per cent. on its common stock.

The Hood Rubber Co., of East Watertown, Massachusetts, has declared a quarterly dividend of 1 3/4 per cent. on its preferred stock, payable August 2 to stockholders of record on July 30.

The Kelly-Springfield Tire Co., of New York, paid on July 15 a quarterly dividend of 1 1/2 per cent. on its common stock.

The United States Rubber Co. paid on July 15 a quarterly dividend of 2 per cent. on its first preferred stock and a quarterly dividend of 1 1/2 per cent. on its second preferred stock.

Bids will be opened by the Bureau of Supplies and Accounts, Washington, August 17, on 5,000 feet of rubber deck hose, 4,000 feet unlined linen hose and a quantity of air and suction hose, under schedule 8621.

MR. DANIELS THANKS THE RUBBER COMPANIES.

Mr. J. C. Daniels, of the Navy, sent complimentary letters on July 29 to the presidents of eight large industrial companies, thanking them for their patriotism by encouraging their employees to serve in the militia, including the naval reserve.

Mr. Daniels thanked them for their assistance towards increasing the national defense. Among those who received these letters were C. S. P. Colt, president of the United States Rubber Co., and Elisha S. Williams, president of the Rubber Goods Manufacturing Co. and of the Hartford Rubber Works Co.

PERSONAL MENTION.

George F. Pell and L. W. Dumont have formed a partnership, as dealers and brokers in crude rubber and gums, under the name of Pell and Dumont, with offices at 66 and 68 Broad street, New York.

Bertram G. Work, president of The B. F. Goodrich Co., is on his way to the Pacific Coast, where he will visit the San Francisco fair. He plans to be absent from his office until September 1.

Frank A. Seiberling, president of the Goodyear Tire & Rubber Co., has been made a member of the board of directors of the American Society of Aeronautic Engineers, of which Thomas A. Edison is chairman.

E. de Kruyff, of Buitenzorg, Java, representative of the Netherlands East Indies at the Panama-Pacific International Exposition, spent a number of days in New York prior to embarking, on July 17, on the return voyage to Java. Mr. de Kruyff was vice-president of the International Rubber Congress and Exposition held at Batavia last fall and is prominent in rubber matters in the Far East.

S. M. Evans, vice-president of the Pitcher Lead Co., has recently been elected a member of The Merchants' Association of New York City.

S. P. Thatcher, formerly chemist of the Peerless Rubber Co., has recently assumed charge, as chemist, of the New York laboratories of the United States Rubber Co.

The Simplex Wire & Cable Co., of Boston, is now represented in New York City by William K. Sparrow, with an office at 30 Church street.

Joseph H. Liston succeeds J. E. Duffield as manager of the Chicago branch office of the Thermoid Rubber Co. of Trenton, New Jersey.

H. W. L. Kidder has recently been appointed manager of the Toledo, Ohio, branch of the B. F. Goodrich Co., succeeding C. W. Wacker, who has been appointed to the management of the Cleveland branch.

H. C. Gentry represents the Acme Rubber Manufacturing Co. of Trenton as manager of that company's tire and mechanical goods sales in the Carolinas, Tennessee, Georgia and Florida.

The yacht "Invader" owned by C. W. Baird, assistant treasurer of the Rubber Trading Co., of New York, recently won the silver cup offered by the Columbia Yacht Club in the speed contest. The "Invader" has a maximum speed of 35 miles an hour.

L. C. Lawton, formerly president and general manager of The Chicago Rubber Co., 218 West Madison street, Chicago, is now located in the Hub building in that city, exploiting The Dutch Guiana Culture Co., of which he is president.

A PROTEST FROM MR. MULLER'S BROTHER.

The July number of this journal contained a brief paragraph regarding the execution by the British government of a man known as F. Robert Muller, convicted of being a German spy. It was stated that it had been thought that this was the F. Robert Muller, who once was connected for a brief time with the rubber trade, but that a letter had been received in Boston from the former rubber man, so far from being disgraced, was a private in the British army.

A letter has been received in this office from H. Christie-Miller, of London, protesting against the impression existing in some quarters that the convicted spy was his brother, F. Robert Muller. He writes: "No more loyal Scotsman ever drew the breath of life, and he is the descendant on his mother's side of a very ancient Scottish family." The friends of the former Boston rubber man will be very glad to know that he is a distinct person from the man who recently received so much unhappy publicity. The name not being a common one, it was perhaps natural, though unfortunate, that this confusion of identity should have occurred.

TRADE NEWS NOTES.

The Faultless Rubber Co., of Ashland, Ohio, gave a dinner on July 8 to its traveling men and heads of departments, the party journeying to LeRoy in the private car of F. E. Myers. Addresses were made by various members of the group and views expressed, the consensus of which was that a great business can only be built up by mutual interdependence between the manufacturing and selling departments.

The Gryphon Rubber & Tire Corporation, recently organized with a capital of \$600,000, has secured a plant at Mt. Vernon, New York, where it expects to manufacture pneumatic tires under a patent by I. S. McGiehan, of London. The plant is 65 x 135 feet, 3 stories high, and will be equipped to produce at the start 250 tires daily.

The United States Tire Co. has opened a direct factory branch at Columbia, South Carolina, in charge of J. E. Doyle, also a sales branch at Macon, Georgia, with J. P. Newsome manager.

In connection with the forty-third annual meeting of the Carriage Builders' National Association, at Cleveland, Ohio, September 20-25, there will be held an exhibition of parts of vehicles and of new models and inventions, with the materials used in their construction.

Reports on conditions at the plant of the Kelly-Springfield Tire Co., at Akron, Ohio, indicate a large gain in this company's business over last year, the increase for the year, if proportionate with that made up to the present time, being estimated at \$3,000,000, with total sales of \$8,000,000. The company is now operating full time, day and night, putting out 1,000 tires a day.

The Monarch Stitched Tire Co., a concern incorporated in Maine in December, 1914, with a capital stock of \$500,000, is reported to have purchased a plant at Seymour Park, near New Britain, Connecticut, where it will engage in the manufacture of a newly patented tire which, it is claimed, is proof against blow-outs. Operations are expected to commence within the next few weeks.

The Fisk Rubber Co. has opened a branch service station in Toledo, at 233 Twenty-first street, in charge of G. C. Wilcox. A two-story brick building has been erected to afford room for an adequate service department and a large stock of tires.

A new vulcanizer has been installed at the factory of the International Rubber Co. at West Barrington, Rhode Island, which considerably increases the capacity of the mill for the manufacture of sheeting and carriage cloth. Another calender is also soon to be added to the equipment of this plant.

The Brooklyn Shield & Rubber Co., Inc., Sumner avenue, Brooklyn, which is an amalgamation of the Brooklyn Shield Co., The Brooklyn Rubber Co. and H. P. Rindskopf, is making bathing cap stocks and is about to put a new bathing cap on the market. The company has in contemplation the addition of a plant for the manufacture of mechanical goods.

A recent product of the Dryden Rubber Co., of 1014-22 Fourteenth street, Chicago, is the Dryden Endless Inner Tube. This tube is in the shape of the tire and the valve is attached by a special method. It is said to be something entirely new and is attracting the attention of the tire trade.

DOMESTIC PRODUCTION OF BENZOL.

There are about ten benzol plants now being erected in the United States, or contemplated, some of them being very near completion. The United States Steel Corporation is putting up three, one in the West, one in the Pittsburgh district and the third at Birmingham, and is planning to build two more. The Republic Iron & Steel Co. is building a benzol plant in connection with its Hazleton coke works. Among other concerns erecting similar plants are the Lackawanna Steel, the Inland Steel and Cambria Steel companies.

The estimated yield of benzol from a ton of coking coal is between two and three gallons. A conservative estimate of the total production from the plants now under construction is 30,000 gallons daily.

The Sydney (Nova Scotia) Steel Mills have established a benzol plant, the product being converted into toluol and naphthalene.

The Edison benzol plant at Bessemer, Alabama, has been completed and is turning out about 2,000 gallons of benzol per day. It is the first of its kind in the South.

SWITZERLAND SEEKS DYESTUFF TRADE WITH AMERICA.

Soon after the outbreak of the war the German government placed severe restrictions on the export of coal tar intermediates. Since then England has been sending quantities of benzol, toluol, naphthalene, aniline, etc., to Switzerland and receiving finished dyestuffs in return. This arrangement has contributed materially to lessen the scarcity of colors in Great Britain. But because of the demand for high explosives England now needs for herself all these materials she can produce. The Swiss are now looking to the United States as a source of coal tar intermediates for manufacturing the dyestuffs so much in demand here and in other countries. Certain Swiss firms propose that American producers of intermediates send them pure coal tar hydrocarbons such as benzol, toluol, naphthalene, etc., to be paid for by an equivalent amount of finished dyes. This offer may be well worth considering, for a proper arrangement might lessen the discomfort to American textile and other industries, rubber included, resulting from the shortage of dyestuffs.

CHEMICAL INDUSTRIES EXPOSITION.

The National Exposition of Chemical Industries will be held the week of September 20 at the Grand Central Palace, New York. It promises to be of great interest and educational value to technologists, manufacturers using chemical products and the general public. Space has been taken for exhibits by several United States Government Bureaus and also for a collective exhibit by Canadian manufacturers. An interesting program is in preparation for lectures and chemical and engineering meetings during the exposition.

The Exposition has been organized, with the co-operation of the International Exposition Co., by Messrs Nagelvoort and Roth with executive offices at Grand Central Palace, Forty-sixth street and Lexington Ave., New York.

ATTRACTIVE HARD RUBBER SPECIALTIES.

The Vaughan-Upton Co., 251 Causeway street, Boston, is making an exceedingly attractive line of hard rubber writing specialties under the trademark name of "Vuco." The line consists of fountain pens, pencil holders for the economical consumption of small pencil ends, and holders carrying small leads, as well as the "Vuco" self-ejecting pen-holder and the "Golfer," a compact little gold-banded pencil with a chain ring, especially adapted for the use of golf players.

Replete with information for rubber manufacturers—Mr. Pearson's "Crude Rubber and Compounding Ingredients."

TRADE NEWS NOTES.

The Harmer Rubber Works at East Millstone, New Jersey, suffered damage from the severe storm of July 8, the sheet iron roof of the plant being completely torn off by the wind.

The Braender Rubber & Tire Co., of Rutherford, New Jersey, is now represented in the State of Maryland by the McGraw Tire Co., Inc., of 10 West Oliver street, Baltimore, its former distributing arrangements in that city being discontinued. This company has also made a change in its representation in New Jersey, where it purposes placing its product with dealers in the principal large cities.

The fire which occurred at the Barrett Manufacturing Co.'s benzol plant at Philadelphia, about the middle of July, caused only slight damage, being extinguished by the company's fire fighting force before the arrival of city firemen.

The June "Bulletin of the Pan-American Union" contains a four and a half page article, re-printed from the April number of the Spanish edition of the "Monthly Bulletin" on the Forsyth Dental Infirmary at Boston, which has been mentioned at various times in this publication and which was erected by John Hamilton Forsyth and Thomas Alexander Forsyth, of the Boston Belting Co., in memory of their deceased brothers and presented to the city as an infirmary for the children of Boston.

The Pennsylvania Rubber Co., Jeannette, Pennsylvania, is manufacturing a Ford type oil-proof vacuum cup tire, 31 x 4. This casing is of extra weight and strength, designed for use on rear wheels of Ford cars used for commercial purposes. It is guaranteed for 4,000 miles.

The tire output of the United States Tire Co. totals slightly over 9,000 automobile tires per day, or 30 per cent. ahead of last year. With the addition of more machinery in the Detroit factory that plant alone will be in position to manufacture 10,000 tires a day. The company expects a production of 1,500,000 tires this year.

Among the exhibitors of the Railway Supply Manufacturers' Association at Atlantic City, held June 9 to 16 were the Goodyear Tire & Rubber Co., Akron, Ohio, which showed samples of Suber's hose; Jenkins Bros., New York City, exhibiting mechanical rubber goods, sheet packing, gaskets, valve discs and rings, new oil-proof sheet packing and car heating discs, and H. W. Johns-Manville Co., New York City, which had a display of friction and rubber tapes.

The name of the Peerless Tire & Rubber Co. has recently been changed to the A. F. Wolke Rubber Co. The capital stock has also been increased from \$10,000 to \$25,000. The debt limit is fixed at \$10,000. Incorporators are A. F. Wolke, Charles H. Wolke, Keith L. Bullitt and J. P. Glenn.

The receiver of the Pope Manufacturing Co., Hartford, Connecticut has sold an option on an unexpired contract for automobile tires, signed by the Hartford Rubber Works Co., now part of the United States Tire Co., to the Maxwell Motor Co., of Detroit, for \$70,000 cash.

W. J. Spencer, of Philadelphia, expects to place his "Noair Compression Tire"—described and illustrated on page 437 of the May issue of this publication—on the market through the Essex Rubber Co., of Trenton, New Jersey.

William Wiltshire of the Cline Co., of Los Angeles, California, has devised a means of protecting the cheekbone of the gunner who uses a hard-kicking "Springfield." He cuts away the stock of the gun at the offending point and sets in soft sponge rubber covered with chamois leather.

A new tri-car chemical fire engine has just been brought out in New York by the Woodhouse Manufacturing Co. This machine, which is made by the Davis Sewing Machine Co., of Dayton, Ohio, is supplied with Dayton airless tires, made by the Dayton Manufacturing Co., and carries, with its other equipment, 200 feet of 3/4-inch chemical hose.

THE RUBBER TRADE IN BOSTON.

Continued from page 1.

The retail trade is active, with some lines in good demand, others not. For instance, last month and the month before were the rainiest June and July on record in the United States. This had the effect of stimulating the retail trade in rubber goods, clothing and in light weight rubber shoes, but it had just the opposite effect on the hose business. The people seem to be fairly well satisfied with present prices, and the belting business is having somewhat of a boom because of the advance in leather belting prices, which have greatly increased because of the European demand for army shoes, harness and military accoutrements. The demand for rubber soles and heels is also good for the same reason. Mechanicals and druggists' sundries are in good demand, while fruit jar rings are going out, seemingly, by the million.

* * *

The Boston Woven Hose & Rubber Co. Mutual Benefit Association, held its first annual field day at Lexington Park, Mass., on July 3. The outing was attended by 600 members and proved very enjoyable. The program included a varied list of sports for both men and women, and a ball game. The latter was played between the Woven Hose and the Edison Light ball teams, both members of the Mercantile League. The score was 8 to 4 in favor of the Woven Hose nine. Appropriate prizes were awarded to the winners in each event. The day's enjoyment concluded with dancing in the evening.

The United States Rubber Co. of New England is now well settled in its great seven-story building just across Fort Point

Channel, on Summer street, about five minutes' walk from the South Terminal station. Here the company occupies nine floors (including basement and sub-basement) with a frontage of about a hundred feet and approximately 100,000 feet of floor area. This affords ample space for the big stocks of goods formerly carried in the five stores which have been consolidated. The store front, with its plate glass first-story, is a handsome one. The various trade mark brands are emblazoned in gold on the windows, and an illuminated sign bearing the "U. S." seal or trade mark shines over the doorway.

The first floor contains the business offices, the sample exhibition and the accounting department. President W. H. Porter has a commodious office at the right of the front door, where he is at all times ready to welcome the visiting customers, and able to have a supervising eye over the whole floor. The information desk is back of the big rubber mat bearing the new "U. S." trade mark or seal, and is in charge of Wallace Campbell, who is an animate directory of the entire establishment.

Back of Mr. Porter's office is the exhibition or sample room, where in electrically lighted plate glass cases, are samples of the many lines of goods made by the various con-

solidated companies. One case is filled with tennis shoes; another with rubber footwear, and here are to be seen some very unique specimens of colored and particolored rubbers. A third showcase is devoted to fountain syringes and hot water bottles, and others to bathing caps and swimming accessories, automobile inner tubes, patches and cements, and to various druggists' sundries. Around the walls and posts are frames containing samples of small molded goods, mechanicals and similar articles.

Back of this room is a row of offices occupied by the managers of the various footwear lines. These are occupied respectively by Charles T. Cooper, manager of the Candee branch; Chester J. Pike, Jr., Hubmark; Clarence L. Weaver, Banigan; H. C. Kalish, Wales-Goodyear, and E. B. Swett, American.

At the left of the entrance is the private office of assistant treasurer, F. A. Cyr, while beyond, and occupying nearly one-half the first floor, is the accounting department, admirably arranged for efficient work. Back of this is the tire department, in charge of Ralph E. Jackson, and the mechanical department, under R. J. Barker. At the rear is the shipping room, with openings on a driveway at the rear of the building.

The second story is devoted entirely to the raincoat business, while the five upper floors, also the basement and sub-basement, contain the stocks of goods. Taken in all its



FIRST ANNUAL FIELD DAY OF THE BOSTON

bearings, the move is an important one, and the one great building a fine home for the consolidated business.

* * *

At the United States Rubber Co.'s headquarters at 140 Essex street one of the sample rooms contains a table on which is shown the largest variety of cemented tennis and other cloth-upper rubber sole shoes on display in this city. While many dealers have full catalogs and price lists of these lines, visiting buyers—who were numerous last month—expressed their surprise at the large variety and the beauty of the samples shown.

* * *

The Enterprise Rubber Co. has for eight or nine years carried on an extensive retail rubber business on Federal street, and the store, with its big plate-glass windows, was one of the attractions of the street, which was promenaded by thousands of business men and women on their way to and from the South Terminal station. The removal of the Candee branch store to the new building on Summer street was the cause of a big clearance sale in June and on the first of July the business was taken over by the Gillett Rubber Co. M. D. Gillett, who has been with the Enterprise company since its establishment in this store, is the manager.

Many readers of THE INDIA RUBBER WORLD are intimately acquainted with John Hopewell, formerly president of the Reading Rubber Co. Mr. Hopewell still retains his business interests in several manufacturing industries, but has turned over to others the rubber business. He is the owner of Maple Ranch Farm, Natick, one of the finest farms in New England, where he has carried on many interesting experiments in agriculture, and where he spends a large part of the year.

* * *

Last month mention was made of the collision between the yacht "Vanadis" and the Boston-New York steamer "Bunker Hill" which resulted in the death of President Kendrick, of the Boston Packing & Belting Co. At that writing few knew that S. P. Sharples, the venerable analytical chemist, whose work in the rubber industry is so well known, was on the same steamer. His stateroom was demolished by the impact of the yacht, but, happily, Mr. Sharples was not in his stateroom at the time, and this is the reason why he is still alive and active and was able to participate, as usual, in the enjoyments of the Rubber Club at its outing mentioned elsewhere in this issue.

* * *

A report appeared in the daily papers of July 19 to the effect that a seven-year-old boy, son of F. C. Hood, a Boston manufacturer, had been drowned at a summer camp. The father of this boy is not Frederic C. Hood, the president of the

The filing of a petition in the United States District Court at Boston recently by Maurice G. Sollers, holder of 60 shares of preferred stock of the Wapole Tire & Rubber Co., asking permission to intervene in the case for the purpose of taking appeal from decrees of the court ordering the sale of the property and in continuing the sale, introduced a new phase in the long drawn out litigation in the settlement of the affairs of that bankrupt corporation.

Mr. Sollers' petition stated that he believed the assets purchased by the New York creditors' committee for \$750,000 to be worth more than that amount and also that there was \$1,000,000 worth of preferred stock and \$1,500,000 common stock of the company still outstanding which would be worthless unless the two decrees were reversed or modified. He asked permission to enter the case in order that he might appeal from the decrees in behalf of himself and a group of stockholders who desired such action.

Attorney Plante, counsel for the creditors' committee which purchased the company's assets, objected to the allowing of the petition before Judge Dodge. He stated that the petitioner had had ample time to object to the decrees, but had not been in court once or made any objection to the proceedings. He said that it would be impossible now to get the parties in the case back to their original status inasmuch as the majority of the assets purchased have since

been sold to the Revere Rubber Co. The filing of this petition marked the entrance into the case of a new stockholders' committee made up of preferred shareholders, said Attorney Plante.

Judge Dodge denied the petition.



WOVEN HOSE & RUBBER CO. MUTUAL BENEFIT ASSOCIATION.

Hood Rubber Co. Mr. Hood's only son is 21 years of age and a recent graduate of Harvard.

Charles Rogerson Haynes, connected with the experimental laboratories of the United States Rubber Co. in Naugatuck, Connecticut, was married on July 21 at the historic North Church in Boston, to Miss Annette Austin, daughter of a former mayor of Galveston, Texas, but who has more recently lived in New York City, where she has gained a reputation as a writer on scientific subjects.

THE RUBBER TRADE IN RHODE ISLAND.

By Our Regular Correspondent.

THE rubber industry throughout Rhode Island continues active. All the manufacturers report good orders with little prospect for any extended shutdown this summer, as has been the case in years past. Most of the factories that are making footwear are in receipt of orders enough to keep them going all summer, it is reported, while the plants that are making tires, automobile accessories and medical goods are working overtime—a condition partially explained, at least, by the continued demand for tires and other rubber goods from Europe.

Vice-President and Manager LeBaron C. Colt, of the National India Rubber Co., at Bristol, has had a large room at the factory equipped as a hospital room and another room fitted up as a reclining room for the women employees of the plant. A room for first aid to persons who were ill or had become injured has been maintained at the factory for several years, but the new hospital and reclining rooms are more elaborate.

The hospital room is on the first floor near the calendering room and is immaculate in its finishings and furnishings of white. It is fitted with the latest appliances used in hospital work. A trained nurse engaged for duty at the factory recently began her work in that capacity. She is also to be on duty nights at the DeWolf Inn, where a number of the women employees live.

The reclining room and first aid room for women operates in a little larger than the hospital room—which is 15 x 20 feet—and is located on one of the upper floors at the north side of the plant near the stitching and shoemaking departments, where the greater number of women are employed.

The output of tennis shoes at the factory of the National company is increasing so that from 10 to 14 freight cars of

shops in the plant. There are now about 100 men at work in the plant, and an extensive stock of shoes of every description is being made every day.

Alterations and improvements are under way which are intended to greatly increase the capacity of the property. Not the least of the improvements is the development of new plans for better and more complete fire protection, and to this end the fire walls and roof trusses, especially, are being strengthened and

In June the severest hail storm within the remembrance of any one living in this State passed over Bristol, causing several thousand dollars' loss in damage to various buildings. At the National factory over 3,000 panes of glass were broken in windows and skylights—incidentally, the workmen employees being thrown into quite a panic. Other factories suffered in the same way, though to a less degree.

Notices were posted at the Alice and Millville mills of the Woonsocket Rubber Co. on July 16 announcing the annual summer shutdown of two weeks for stock taking and general repairs, the last day's making to be Friday, July 30. The Alice mill, at Woonsocket, employs about 1,500 hands, and 700 are employed in the Millville factory, at Millville.

Business has been so brisk at the two mills of the company that there was some doubt as to whether or not the annual closing would take place this year. The necessity for stock taking and repairs, however, forced the step. There is every assurance that the excellent business conditions which have prevailed at these factories for a number of months past will continue for the remainder of the year.

The Smith Webbing Co., Pawtucket, has recently been taken over by the Everlastik Co., of Massachusetts, which, though of comparatively recent origin, has taken over several webbing plants in Massachusetts. The Smith Webbing Co., which was owned largely by Pawtucket and Central Falls interests, has been engaged in the manufacture of elastic and non-elastic webbing and has lately built up a large business in a patent elastic belt. The late Charles S. Smith, who was the president and controlling factor in the concern, was killed in an automobile accident a few months ago in Pawtucket.

The promptness with which the ranks of the military organizations of Rhode Island are being filled since the movement started by the United States Rubber Co. in advocating that its employees identify themselves with the National Guard is causing considerable comment. Many men of military age in the employ of the rubber firm have already joined the service, while many more are considering similar action. The example set by the United States Rubber Co. has been followed by many of the large concerns in this vicinity.

The United States Rubber Co. has erected a large addition to its main factory in Providence, which more than doubles the capacity of the former quarters. The company is working on the new building nights a week making solid tires, some of which are being shipped abroad, and also turning out large quantities of rubber thread for elastic fabrics.

Since the starting of the new vulcanizer at the plant of the United States Rubber Co. at West Barrington the force of the plant has been considerably increased. The outlook for the coming of futures and the indications for the coming of a new era in the industry are all pointing to a bright future in the months to come.

The United States Rubber Co., Pontiac avenue, Cranston, manufactures a large quantity of tires, and is making extensive additions to

The No. 2 rod mill of the Washburn Wire Co. in Phillipsdale, was closed the last week in June and the first week in July while a new bed was being placed beneath the engine in that department. Foundations are being put in for an extension of the yard crane at this plant, which will almost double the area reached by the crane, which is used in shipping, receiving and distributing stock.

The Phillips Insulated Wire Co., Pawtucket, has awarded the contract for the construction of a one-story machine shop, 60 x 100 feet.

* * *

George Nicholson, treasurer of the Nicholson File Co., Providence, an uncle of S. M. Nicholson, director of the United States Rubber Co.—died of Bright's disease July 16 at his home, 181 Adelaide avenue. He was 72 years old and had been ill for about three months. He was born in Pawtucket, this State, in 1843, and when a young man removed to Whitinsville, Massachusetts, but soon returned to Providence. He had been treasurer of the Nicholson File Co. for the past 34 years. He is survived by his wife.

THE RUBBER TRADE IN AKRON.

By Our Regular Correspondent.

NO better indication of the condition of the rubber business in this city can be found than that contained in the report of the tax commissioner for the county, which shows an increase in personal property valuations since the report of last year amounting to \$1,333,000, with land values remaining the same as a year ago. Of the principal companies the largest increase is in the holdings of The B. F. Goodrich Co., whose reported valuation of combined personal and city property is \$21,000,000, or \$1,000,000 in excess of that of last year. This company will pay the highest taxes collected by the city, \$138,000. The Goodyear Tire & Rubber Co. will pay \$67,000 taxes. The personal property of this company is listed at \$4,944,000, or \$200,000 less than a year ago, this decrease being attributed to shortage of stocks of rubber and other raw materials early in the year, when the embargo was in force, the appraisal being based on a monthly average for the year. The next largest valuation is that of the Firestone Tire & Rubber Co.—\$4,130,000—which is \$100,000 over that of 1914. The Kelly-Springfield Tire Co. shows an increase of \$166,000, with a total of \$848,000; the Miller Rubber Co. a gain of \$42,000, with a total of \$685,000; the Swinehart Tire & Rubber Co., \$71,000, with a total of \$310,000. The Portage Rubber Co. reports a personal property value of \$177,000, which represents a \$16,000 increase. The personal holdings of the Marathon Tire & Rubber Co., of Cuyahoga Falls, near Akron, are listed at \$184,000, an increase of \$69,000, and those of the Falls Rubber Co., of the same place, at \$135,000, or \$66,000 over those of last year.

Practically every rubber factory reports excellent business and full time operation of plants, one company even finding it necessary to call in many of its traveling men early in July because of inability, at capacity production, to turn out goods fast enough to fill orders.

The water famine which threatened at one time this summer to seriously handicap the factories of this city has been relieved by the recent heavy rains. Water shortage is a condition not likely to be repeated, however, for the new water works system, now almost completed, will be capable of supplying water at the rate of 35,000,000 gallons a day even in unusually dry weather. The present average daily consumption is placed at 12,500,000 gallons. The Cuyahoga river is the source of supply for the new system, an area of about 1,400 acres bordering on this stream having been purchased and developed for the purpose, at a total cost of about \$4,500,000.

Work has been started on the new six-story building of

The B. F. Goodrich Co. This building will be L-shaped, with each wing about the length of a city block. The construction company has promised its completion, ready for machinery installation, by late fall.

The publicity department of this company has recently been making some rough estimates of the saving to tire users throughout the country effected by the price reductions that took effect early in the present year. This is placed, at an average of \$3.50 per tire, at about \$25,000,000 per year. It would, however, undoubtedly reach considerably larger figures, for this estimate is based on but one set of tires per year for each of the 1,623,555 cars carrying pneumatic tires now registered in the United States.

The Goodrich Silvertown Cord tire has been conspicuous in a number of the late racing events.

The Goodrich company has issued the following statement in regard to operating results in the first half of 1915:

"After making proper allowances for maintenance, depreciation, bad debts and all outstanding liabilities, etc., the net profits for the period amounted to approximately \$4,000,000.

"The company has redeemed and cancelled out of surplus preferred stock to the value of \$2,000,000, leaving \$28,000,000 outstanding. The amount of quick assets over current liabilities shows a gain of approximately \$3,016,866.16 for the period.

"The officers have recommended to the board of directors that no dividend be declared on the common stock at this time."

These figures indicate a considerable gain over those for the corresponding six months of 1914, when the net income after maintenance and depreciation had been provided for amounted to \$2,651,278.

* * *

At the factory of the Firestone Tire & Rubber Co., where work is being rushed both in the present plant and on the new additions, the employees are enthusiastic over the annual picnic which is to be held at Silver Lake Park on Saturday, July 31. A full program of sport events has been arranged, and an attendance of about 5,000 is expected.

The Firestone company has announced plans for a club house for employees, to be built this summer opposite the plant on South Main street. It will contain a swimming pool, shower baths, bowling alleys, a barber shop and a model restaurant, and will be connected with the factory by a tunnel under the street.

* * *

The Portage Rubber Co. will give an annual outing to its employees on August 7. Arrangements have been made for special cars to convey them to Springfield, where the outing will be held on the shores of the lake.

* * *

On August 14 the Miller Rubber Co. will give an outing. The Miller company is making a new rubber sponge said to possess all the qualities of the ordinary rubber sponge with added durability and to be made by the addition to the rubber of a compound which has the same effect on the rubber that yeast has in bread, the mixture being baked and expanding as it becomes heated.

This company is enjoying a war business in tires not only in Europe, but in Mexico, where automobiles have come to play an important part in the continued military operations. Miller tires are being supplied for the army transports and military automobiles of the Villa forces.

* * *

The Goodyear Tire & Rubber Co. reports an excellent business in hose during the season, as well as in all lines of mechanical rubber goods. During the first six months of the year 3,700,000 feet of hose, a quantity equal to its entire production in 1914, was turned out in the Goodyear factory, and in one recent week alone the output amounted to 240,000 feet.

This company is about to construct a model system of gas tanks approved by building inspectors as completely eliminating dangers arising from the storage of gasoline, against which legislative restrictions were passed a few weeks ago. This system provides for 10 to 15 tanks, each insulated in water to prevent leakage and consequent danger of explosion.

The rumor, not as yet officially verified—is current in this city that a gigantic war dirigible is now in process of manufacture by the Goodyear company for the United States government, as a test machine, which, if successful in operation, will be adopted as a type for use in the aerial service of this country and to form a nucleus of a dirigible squadron.

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Work was begun early in July on an addition to the tire plant of the Mohawk Rubber Co. This company doubled its plant area by its building operations of last spring, and this new addition will mean a similar increase.

* * *

The manufacturers of rubber mill machinery are also running their plants to capacity, and the Adamson Machine Co., in a report at its recent quarterly meeting, showed all departments operating 24 hours a day. The company has declared a quarterly dividend of 2½ per cent., payable August 1, which is ½ per cent. in excess of the previous quarterly stock dividends of this concern.

* * *

The court has dismissed, on a technicality, a petition filed by a stockholder of the East Palestine Rubber Co., of East Palestine, Ohio, that that company be placed in the hands of a receiver.

The Republic Rubber Co., of Youngstown, about July 1 received a cable order for \$500,000 worth of solid rubber tires for export to Europe, the order calling for delivery of 10,000 tires per month, built on special steel rims, for use on army trucks. This followed an order now almost completed, from the same source, for \$250,000 worth of similar tires.

The McClurg Rubber Co. recently organized to manufacture rubber tires, expects soon to commence operations. The following officers have been elected: President and general manager, J. S. McClurg; vice-president, C. M. Christensen; secretary and treasurer, H. T. Forrest. These officers, with W. Z. Davis and J. L. McClurg, compose the board of directors.

* * *

A. H. Marks, vice-president of The B. F. Goodrich Co., spent a few days in Akron early in July, attending a meeting of directors of the City hospital, for the consideration of plans for hospital additions, and also to look after business at the plant, returning to his summer home at Marblehead, where his yacht is stationed. He has recently had a pipe organ installed in this new yacht.

W. F. Pfeiffer, secretary and general manager of the Miller Rubber Co., and Mrs. Pfeiffer have returned from their visit to the California expositions and other points of interest on the coast.

W. C. Swift has resigned his position as efficiency engineer with the Miller Rubber Co. and is reported to intend removing to New York.

P. W. Litchfield, factory manager of the Goodyear Tire & Rubber Co., completed 15 years of service with that concern on July 15. A banquet was tendered him by the company, at which he announced his intention of donating \$100,000 to the welfare work of the employees, and a committee of workers has been chosen to formulate rules by which this fund is to be used for their welfare.

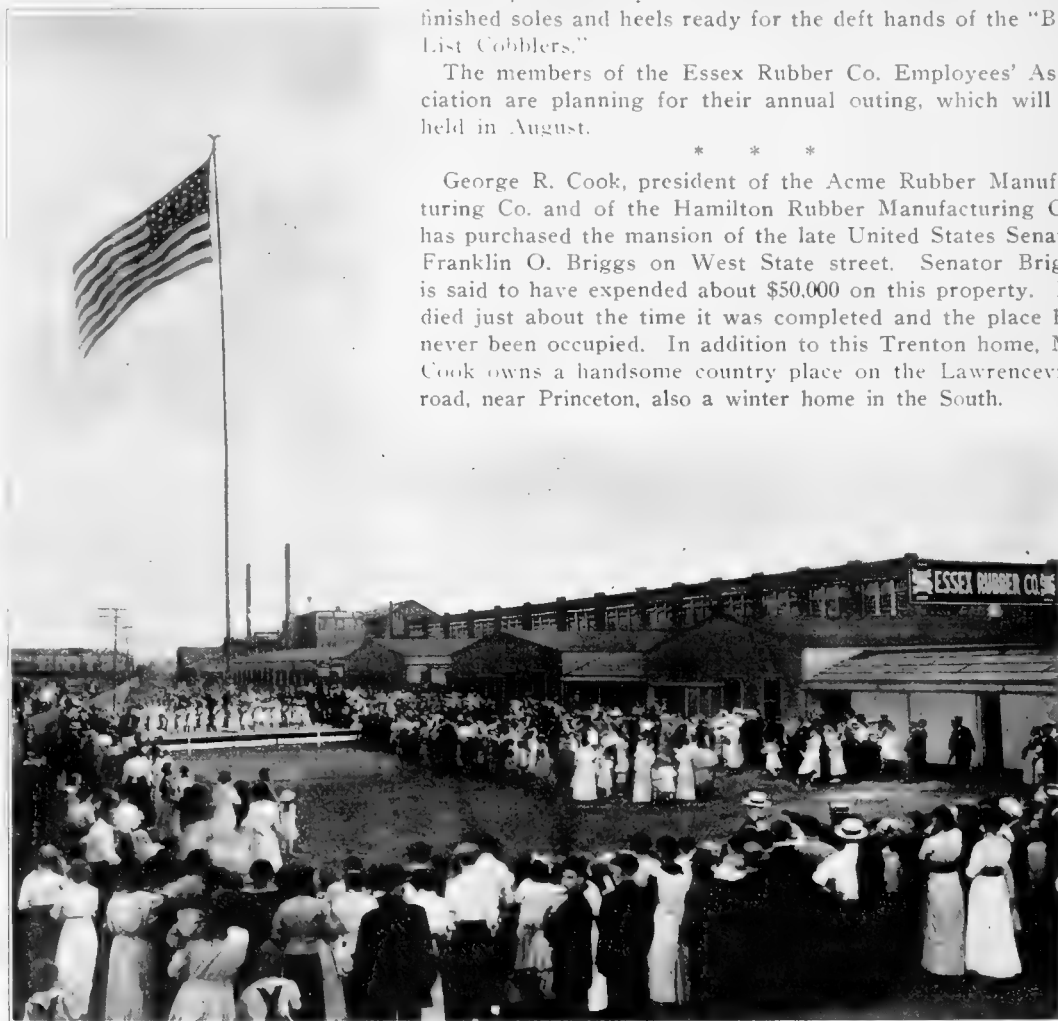
Irene Seiberling and Penfield Seiberling, daughter and son of F. A. Seiberling, president of the Goodyear company, were passengers in one of the recent flights of the balloon "Goodyear."

Correspondent.

The flag raising was the outcome of the annual meeting of the Essex Rubber Co. Employees' Association, which was held on Flag Day. One of the employees suggested that it would be a fine thing to present a flag to the company if the firm would erect a pole. This, it was suggested, would serve a double purpose in registering devotion to the government and loyalty to the company. Among the members of the organization were many men of foreign birth, whose native countries they had to do with one another, yet they enthusiastically seized this opportunity to give

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George R. Cook, president of the Acme Rubber Manufacturing Co. and of the Hamilton Rubber Manufacturing Co., has purchased the mansion of the late United States Senator Franklin O. Briggs on West State street. Senator Briggs is said to have expended about \$50,000 on this property. He died just about the time it was completed and the place has never been occupied. In addition to this Trenton home, Mr. Cook owns a handsome country place on the Lawrenceville road, near Princeton, also a winter home in the South.



FUNG. RAISING AT THE ESSEX RUBBER CO. PLANT.

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The American Rubber Manufacturing Co. of New Jersey, whose plant was destroyed by fire April 27, started last week in its newly built factory to make mats and soles, and reports a good line of orders on hand. Much of the machinery in the old plant was saved.

The owners of tire workers from the various Trenton factories have begun to hold mass meetings for the recruiting of more members. No indications of a demand on the factory owners have thus far appeared, but it is probable that some such move is contemplated. It is a little more than 20 years since the manufacture of automobile tires was begun in Trenton, soon after the first automobiles came into use. During this time the industry has grown to large proportions and several hundred men are now employed in the local factories in this line of business.

Lambertville is to have another rubber factory, a tire making concern—if negotiations now under way do not fail. Those interested in trying to get the company to locate there will not for the present divulge its name.

Another raincoat company, The Trenton Co., has been formed in this city. The members of the firm are Daniel J. Madden and Alfred Schragger, and their plant will be at 226 and 228 South Warren street.

Some interesting facts pertaining to the rubber industry in New Jersey are set forth in the advance sheets of the report of the State Bureau of Industrial Statistics. The report covers the field up to the first of 1914 and compares conditions of 1913 with those of 1912. The rather unusual fact is set forth that there was less capital invested in the industry in 1913 than there was in 1912, yet far more goods were manufactured.

Following are some excerpts from the report:

Number of factories engaged in hard and soft rubber manufacture, 56.

Capital invested in 1913, \$30,005,296—a decrease of \$809,698, or 2.6 per cent., from that of 1912.

The value of stock used in 1913 was \$25,308,839—an increase of \$444,079, or 1.8 per cent., over 1912.

The factory selling price of goods made in 1913 was \$42,544,723—an increase of 10.4 per cent. over the previous year.

Persons employed in the trade were: Men, 8,125; women, 1,326; children, 169; total, 9,656. This represents an increase of 785 over the previous year.

The average yearly earnings of employees in 1913 was \$569.87—an average increase of 4 per cent. over 1912.

THE COX AUTOMATIC LOAD REGULATED AIR SPRING.

This air spring performs the function of the present leaf spring and is so arranged that the air pressure is increased and decreased automatically in accordance with the load.

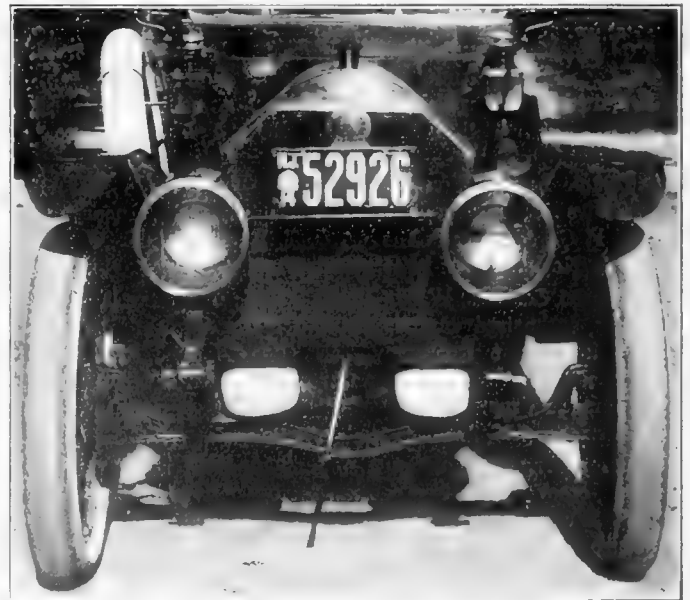
The main features are a spherically formed collapsible bulb with integral shanks, one solid and the other hollow, a pair of conically formed plungers, an auxiliary air reservoir and a pressure regulator. The bulb, or Air Cushion Spring is fabricated throughout and its construction is similar to that of the pneumatic tire. It is positioned between the pair of conically formed plungers, one of which is bolted to the axle

and the other to the chassis. Conducts connect the spring via the hollow shank to the air reservoir. An air pump attached to the motor pumps the air into the high pressure tank as required, from which it passes through an air pressure regulator to the low pressure reservoir and air spring, but only as demanded by the load. When the load is removed the air pressure regulator automatically releases the then surplus air.

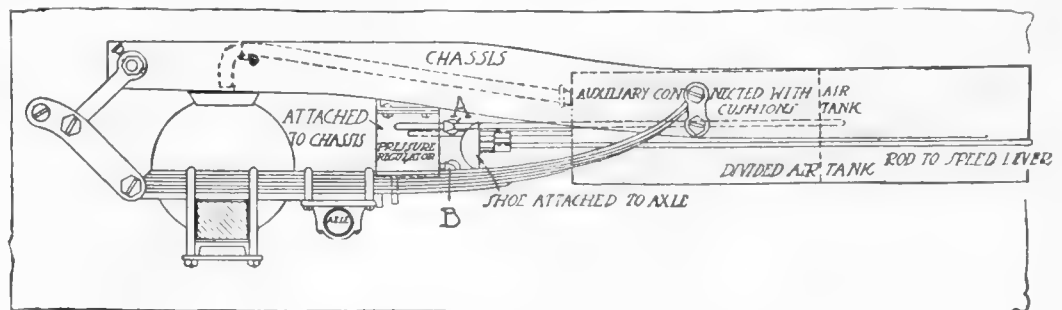
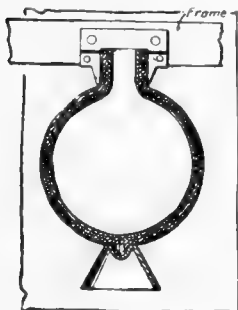
The resiliency of the Cox Air Spring when compared with the steel spring may be measured more accurately by the difference in the resiliency of the pneumatic tire and the solid tire, consequently the up-keep of the vehicle is reduced by quieting the vibrations and holding the tire truly to the roadbed. The inventor believes that the experiments tried on different weight vehicles, including five-ton trucks, prove its feasibility for street cars and railroad coaches.

The accompanying photograph shows a front view of an automobile with two of these cushion springs placed in front. On a heavy truck they would naturally be used both front and rear, while with a particularly heavy load, four can be used to advantage at the rear axle. The drawing shown below gives, in the left hand panel, a cross section of the cushion while the right hand panel shows how it is attached to the chassis and the spring and how it is connected with the air tanks.

This cushion spring has been thoroughly tested in this country during the last few years and has also been examined and tested by several companies abroad, namely: The Michelin Tire Co., of Clermont-Ferrand, France; D.



Napier & Son, Limited, Acton, London; The London General Omnibus Co., Limited, and George Spencer, Moulton & Co., Limited, London. [The Cox Pneumatic Cushion Co., 2010 Broadway, New York City.]



THE CARE OF FIRE HOSE.

At the convention of New York State Fire Chiefs held at Peckskill, New York, June 23-24, interesting papers were read by A. J. Fletcher, of the Fabric Fire Hose Co., New York, and

M. J. Burke, of the Eureka Fire Hose Co., New York, on the "Treatment and Care of Fire Hose." Substantially the same rules were given by both authors, the gist of which was that rubber-lined hose should be cleaned of adhering mud or dirt. The rubber tube should not acquire a permanent set in folds, nor freeze or get dried out. It was recommended to straighten out the hose and wet it internally with water at least once a month.

NEW INCORPORATIONS.

Broadway Tire Exchange Co., Inc., June 26, 1915; under the laws of Rhode Island; authorized capital, \$10,000, divided into shares of \$100 par value each. Incorporators: Raffaele and Giustino Tortolani and David Miller—all of Providence, Rhode Island. To engage in the business of buying, selling, trading, manufacturing, repairing and otherwise dealing in automobile and other vehicle accessories and supplies.

Centaur Rubber & Tire Co., Inc., The, July 6, 1915; under the laws of Delaware; authorized capital, \$500,000. Incorporators: F. D. Buck, George W. Dillman and M. L. Horthy—all of Wilmington, Delaware. Location of principal office, Delaware Charter Guarantee & Trust Co., du Pont Building, Wilmington, Delaware. To import, export, manufacture and deal in, either through the medium of agents or otherwise, automobile tires and all other kinds of rubber goods.

Double Grip Garter Co., Inc., July 1, 1915; under the laws of New York; authorized capital, \$25,000. Incorporators: Maude A. Latham, 407 Audubon avenue, and Dudley E. Latham, 165 Broadway—both in New York City—and Anna Kolbe, 250 Second street, Union Hill, New Jersey. To manufacture elastic and web goods, etc.

Double Service Tire & Rubber Co., The, June 9, 1915; under the laws of Ohio; authorized capital, \$50,000. Incorporators: Carl F. Geyer, Max S. Glover, D. T. Bowlus, W. C. Walton and W. A. Nash. Location of principal office, Akron, Ohio.

Duncan Co., Inc., W. H., June 24, 1915; under the laws of New York; authorized capital, \$5,000. Incorporators: M. M. and W. H. Duncan, Rockaway Park, Long Island, and James N. MacLean, 629 Throop avenue, Brooklyn—both in New York. To manufacture materials for auto. and carriage tops, waterproof cloths, etc.

Essex Tire Construction Co., June 10, 1915; under the laws of New Jersey; authorized capital, \$125,000. Incorporators: William Barth, Madison; Frank H. Butterworth and Frederick Monro Marvin, 958-60 Springfield avenue, Irvington—both in New Jersey. Location of principal office, 958-60 Springfield avenue, Irvington, New Jersey.

Gryphon Rubber & Tire Corporation, July 9, 1915; under the laws of New York; authorized capital, \$6,000. Incorporators: Samuel A. Cunningham, 2 Wall street; Percival S. Jones, 5 Nassau street—both in New York City—and Lionel Emdin, Deal, New Jersey. To manufacture rubber goods, etc.

Hawkeye Tire Co., July 3, 1915; under the laws of Delaware; authorized capital, \$500,000. Incorporators: I. V. MacLean, John T. Christie, C. B. Hextell, T. H. Dexter, and E. G. Rafinsperger—all of Des Moines, Iowa. Location of principal office, Equitable Building, Wilmington, Delaware. To manufacture and deal in all kinds of automobile tires, inner tubes, etc.

Miller-Baxter Rubber Co., June 29, 1915; under the laws of Delaware; authorized capital, \$150,000. Incorporators: Morris B. Baxter, Alfred Petersen, Oscar L. Hall, Edward Lee Owen—all of East Liverpool, Ohio—and Hollie H. Forrest, Chester, West Virginia. Location of principal office is with Francis H. Hof-

fecker, 845 Market street, Wilmington, Delaware. To manufacture, purchase, buy, sell, import, export and deal generally in rubber and gutta percha, and all articles of which rubber is a component part.

Miller Rubber Co., of Canada, Limited, The, May 25, 1915; under the laws of Canada; authorized capital, \$50,000. Incorporators: Michael Montag, James Miller, John Karn, Edwin Robert Patteson and Robert Burns—all of Toronto, Ontario. Location of principal office, Toronto. To manufacture, buy, sell and deal in articles composed of rubber either solely or in combination with other substances; surgical and hospital supplies, automobile, motorcycle and bicycle tires, etc.

Mutual Tire & Rubber Co., March 5, 1915; under the laws of New Jersey; authorized capital, \$125,000. Incorporators: Franklin B. Platt, Joseph Hopkins and William J. Dallas—all of Haddon Heights, New Jersey. Location of principal office, 531 Federal street, Camden, New Jersey. To manufacture, buy, sell and exchange tires, casings, tubes and liners of all kinds, etc.

Newark Mat Co., Inc., July 2, 1915; under the laws of New York; authorized capital, \$15,000. Incorporators: Clifton B. Jordan (president), 140 Claremont avenue, New York City; Charles R. Dollman (vice-president), 668 Palisade avenue, West New York, New Jersey, and Samuel A. Williams, (secretary and treasurer) 7 West Eighth street, New York City. Location of principal office, 11 Broadway, New York City. To manufacture a combination rubber-metal mat as a specialty, essentially a rubber mat reinforced by brass; also all kinds of rubber mats and matting.

Ohio Tire & Supply Co., The, May 28, 1915; under the laws of Ohio; authorized capital, \$5,000. Incorporators: R. B. Tripp, George T. Miller, Lawrence G. King, Minnie R. Burnage and Clayton C. Townes. To manufacture automobile parts and accessories.

Simplex Rubber Co. of America, Inc., The, July 3, 1915; under the laws of New York; authorized capital, \$300,000. Incorporators: Nathaniel A. Campbell, 31 Pine street, Albert C. Travis, 71 Broadway—both in New York City—and Evan Gwynne-Evans, Tarrytown, New York. To manufacture rubber goods of all kinds.

Star Rubber Co., Inc., July 13, 1915, under the laws of New York; authorized capital, \$5,000. Incorporators: Carrie M. Downing, Vauxhall, New Jersey; D. Ronald Downing, 830 West One Hundred and Seventy-ninth street, and Samuel Gordon, 302 Broadway—both in New York City. Rubber goods, auto. accessories, etc.

Staunton Jar Corporation, June 8, 1915, under the laws of New York; authorized capital, \$100,000. Incorporators: Gray Staunton, Stamford, Connecticut; William R. Smith and Odell R. Blair—both of Buffalo, New York. To manufacture jars, rubber goods, etc., under the laws of New York.

Twin City Tyre & Supply Co., Inc., July 16, 1915; under the laws of New York; authorized capital, \$5,000. Incorporators: John Sloan, 854 Fourth avenue; James Hansen, 618 Third avenue—Upper Troy—and Laura Foley, 335 Tenth street, Troy—all in New York. Tires and auto accessories.

Westchester Oil & Rubber Co., Inc., July 16, 1915; under the laws of New York; authorized capital, \$5,000. Incorporators: Charles E. McCormack, W. Frank Baily and Charles A. Barnard—all of Mount Kisco, New York. Auto. supplies, tires, oils, etc.

Western Reserve Rubber Co., The, July 2, 1915; under the laws of Ohio; authorized capital, \$10,000. Incorporators: George E. Hall, Fred M. Hall, Arthur P. Witter, Meade Chamberlin and William C. Johnson. To manufacture rubber specialties, novelties and rubber goods of every description.

Should be on every rubber man's desk—Crude Rubber and Compounding Ingredients; Rubber Country of the Amazon; Rubber Trade Directory of the World.

The India Rubber Trade in Great Britain.

By Our Regular Correspondent.

GENERAL REMARKS

WITH no early cessation of hostilities in sight, the rubber trade pursues much the same course from month to month. Though business all around continues to be decidedly good, troubles with regard to scarcity of labor have increased rather than diminished, and though we are by no means in the condition of the other belligerents, who have universal service, yet we continue to approach their industrial conditions more closely. The effect of the Munitions Bill is beginning to be felt in the withdrawal of skilled mechanics from works making rubber machinery to engage in the manufacture of munitions, and more unlikely things are in prospect than the taking over of rubber machinery works for the above purpose. At any rate, at the present time firms ask nine months for delivery of machinery which would in happier times have been delivered in two months. This, of course, is against development and the exploiting of new ideas with regard to tires, etc.

The biggest extension of works on hand is the new factory of the Dunlop Rubber Co., Limited. This is situated about four miles from Birmingham and work has already been started on the foundations. As great promptitude has been shown with the whole scheme, presumably the machinery is already purchased or under construction, and as the firm is so largely engaged on government work it is hardly likely that difficulties would be put in the way of obtaining the necessary machinery. With other firms, differently situated, however, great delays seem to be inevitable. The forthcoming National Service Register may possibly prove the existence of a goodly number of unemployed rubber experts willing to put their services at the disposal of their country.

A point regarding government contracts on which there appears to be some misunderstanding is that specifications regulating the exact composition of rubber goods are only issued in respect to certain goods, notably for what are known as admiralty qualities. In other cases, as, for instance, the important one of solid tires, the goods have to be up to a certain standard, but the details of their composition are left to the manufacturers. Whether high quality reclaimed rubber is used or not is a matter on which I am not qualified to speak, but its use is not forbidden except in specific instances. A recent order of the Privy Council regarding prohibited exports contains the phrase "goods made wholly or partly of rubber" instead of the former phrase "goods made wholly of rubber." Further, in addition to rubber the following are now on the list of prohibited exports, gutta percha, balata, Borneo guayule, jelutong, Palembang, Pontianak and all other substances containing caoutchouc. Under the circumstances this was only to be expected. With regard to all other substances containing rubber some complications may arise, as various names are in use for what have been for convenience styled pseudo rubbers, and, moreover, not much is known about them as to their importation and disposal. For instance, our old friend, variously known as potato rubber, *Euphorbia* gum and also *Tuna* gum—which I believe is not really the same thing—still comes in quantities to certain firms, while other important firms would not know it if they saw it. As caoutchouc is more widely distributed in plant life than is generally supposed, perhaps it would have been as well to indicate some such maximum amount as 2 per cent, so as to eliminate the banana artichoke and chickweed varieties.

Considering the adverse effect of the war upon trade journalism generally, it is not surprising to hear that the "Rubber

World," of London, is to cease publication and to wind up. It was the last of the special journals founded during the rubber boom to serve the fallen interest of the public in the topic, and its prolonged life speaks much for the journalistic enterprise and acumen of Mr. F. A. Salmon, its guiding star.

TRADE NOTES

It may be remembered that some time ago the Sirdar Tyre & Rubber Co., whose works are at Bradford-on-Avon, got into financial difficulties and was carried on under a receivership. Later the works were announced for sale, but were ultimately disposed of by private treaty, which involved the introduction of a considerable amount of capital. These works, which were well equipped with machinery, are now in full swing again under the old title and are busily engaged on government orders. This observation applies with equal force to the other works in the west of England, namely, the Avon Rubber Co., Limited, Spencer Moulton & Co., Limited, and Wallington, Weston & Co., Limited.

The Rubber Regenerating Co., Limited, of Manchester, continues to expand under the active management of Mr. McKusick, who has now got out plans for further extension of the works, that procedure having become an annual event. Mr. McKusick is no believer in the somewhat doleful forecasts for the reclaiming business indulged in by Mr. Maclaren, of the "India Rubber Journal," a year or two ago. Mr. McKusick holds the opinion that as long as rubber goods are made old material will be reclaimed and that as far as the financial side is concerned the prices of new rubber and of scrap rubber will continue their market movements in unison.

The Weber Rubber Co., Limited, of Collyhurst, Manchester, is a rubber heel manufacturing concern which has been hit by the closing of the Continental markets and is now under the management of a receiver appointed by the court. This company has not now any connection as regards proprietorship with the company called the New Turco Rubber Co., Limited.

SCIENTIFIC AND PATENT LITERATURE

Not unnaturally under the circumstances, the last nine months have witnessed a paucity of contributions to the chemical side of our industry, and more particularly from Continental sources. With regard to synthetic rubber, if this is being made in Germany at a time when its advent there must be especially welcome the fact is unlikely to be announced to the world, while as for our own Synthetic Products Co., no doubt they are giving all their attention to the production of acetone, which is largely required in munitions manufacture. A recent paper by Dr. Stevens on the role of litharge in vulcanization is an interesting contribution to the technology of rubber. It is to be found in the "Journal of the Society of Chemical Industry" for May. The fact that sulphate of lead is to be found in goods vulcanized with sulphur and litharge was perhaps not very generally known and the analytical procedure he has devised for determining the sulphide and sulphate of lead in rubber goods forms an interesting addition to rubber analytical methods.

The "miserable secrecy" which the late Dr. Weber said characterized the works of our rubber manufacturers' laboratories is not being maintained by our largest firm, the North British Rubber Co., Limited. At the last London Rubber Exhibition the firm's chemists showed up prominently, both

in the reports of papers and in the discussions. Except in the case of the Leyland & Birmingham Rubber Co., Limited, it is not likely that their example was not followed by other firms of importance. A further contribution from the North British company is to be found in the June 15 issue of the "Journal of the Society of Chemical Industry," in the form of a paper by Messrs. Wheatley and Porritt, describing a new machine for the preparation of vulcanized rubber for analysis. The machine is briefly an improved application of the time honored file and seems destined to give excellent service in the case of goods to which the file was applicable. With regard to raw rubber and reclaimed rubber, however, the new machine, as the authors definitely imply, leaves us much in the same position as before.

RUBBER MEN IN ACTIVE SERVICE.

Rolls of honor with the names of members who are in active service are now familiar objects in clubs, headquarters of societies, business premises, etc. To attempt any such in the case of a whole industry would prove a very formidable task, though we may yet see something done for the rubber trade on a more complete and comprehensive scale than the present casual notices of certain combatants which have appeared in the technical press. By way of adding to these scattered allusions it is with much regret that I mention the death on active service in the Dardanelles of Lieutenant Col. J. A. Fallows, of the Eighth Lancashire Fusiliers (Territorial Force). His battalion was one of the first to volunteer for foreign service and went to Egypt last September. The deceased had been connected with the Leyland & Birmingham Rubber Co., Limited, for 30 years and was well known in Manchester, having been for many years manager of the company's depot in that time. In recent years he had been entirely at the works and at the outbreak of war held the positions of commercial manager and departmental director. A memorial service held at Leyland church was attended by the directors and officials of the company, and it is superfluous to add that his loss will be keenly felt by his numerous friends in the rubber trade.

Rupert Turner, of Turner Bros., Limited, Rochdale, is attached to the Royal Army Medical Corps and has been in active service since last September in connection with ambulance work. His firm has given an ambulance car and also a repairing car for field service.

Walter Wild, late works manager of Wood Milne, Limited, is now a lieutenant attached to the First Manchester Territorials.

O. G. Moseley, of David Moseley & Sons, Limited, has taken a commission in the Earl of Chester's Yeomanry. Mr. Moseley has been well known in the hunting field and on the polo ground.

Lieut. Sath, special reserve First East Lancashire Regiment, has been awarded the Military Cross, the new distinction for service at the front. He has been wounded and invalided home on two occasions. At the outbreak of war he was chemist at the works of the Premier Waterproof & Rubber Co., Limited, of Manchester.

Second Lieut. Wallwork, whose father is well known in connection with Thomas Rowley & Co., of Manchester, has been wounded in service with the Ardwick Territorials at the Dardanelles.

Sidney Frankenburg, of the well known Salford firm, is engaged in ambulance car work with the Expeditionary Force in the Continent.

V. Frankenstein, of P. Frankenstein & Sons, Limited, of the Victoria Rubber Works, Manchester, has joined the Motor Transport Corps.

Should be on every rubber man's desk—Crude Rubber and Smelting Ingredients: Rubber Country of the Amazon; Rubber Trade Directory of the World.

100 YEARS IN THE NORTH BRITISH RUBBER CO. EMPLOY.

The North British Rubber Co., Limited, Castle Mills, Edinburgh, is notable, among other things, for the extreme length of time it retains its employees and the loyalty of the latter to the concern. Previous issues of this paper have noted specific instances of long periods of employment, and another has just come to our notice through the presentation of a gold watch and an illuminated address to Alexander Murray McKenzie by the management of the North British company on the occasion of his retirement, about July 1, on the completion of 42 years' service. Mr. McKenzie's father was in the employ of the company for 30 years, and other members have brought the combined services of the McKenzie family in the North British company up to a total of about 100 years.

MASTER AND SERVANT.

Under the above title "The India-Rubber Journal" of April 24, 1915, notes an interesting case upon which judgment has recently been given in the Court of Appeals, affecting the relation of master and servant, using these terms for employer and employee.

A certain draughtsman reached the position of leading draughtsman and eventually head of the selling department of an English company. On attaining this position he signed an agreement that if he left the company's employ he would not for seven years thereafter enter the employ of any other concern in the same business. This agreement he did not observe, but took service with a competitor. Action was taken by the first company to compel its former employee to observe his agreement. The trial justice rendered a decision in favor of the employee, on the ground that such an agreement was against public policy and could not be enforced. Appeal was taken against this judgment and a majority of the judges of the Court of Appeals upheld the original decision on the same ground. The law is stated as "On the one hand it was in the public interest that a covenant should be observed and enforced, but it was also in the public interest that a man should be free to use his skill and experience to the best advantage."

Doubtless such an agreement as the above is rarely required by American manufacturers in any line, although there are intimations that the signing of similar contracts has been required in the rubber trade. They would probably fail of enforcement as completely in the United States as in England if tested in the courts.

The New York Belting & Packing Co. has discontinued its London office and will transact business through the United States Rubber Co., Limited, 47 Farringdon street, London, E. C. The goods offered and the organization will remain as before.

An experimental section of rubber pavement has been laid in front of the Malay States Information office at 88 Cannon street, London. The tiles are 12 inches square and 1 1/2 inch thick, manufactured from plantation rubber.

The war has reduced the number of licensed buses being operated in London from 3,406 one year ago to 2,211 at the present time.

The Dunlop Rubber Co., Limited, of Birmingham, has contributed to the new British war loan to the extent of £250,000.

Waste Rubber (North Western), Limited, has been registered in London, with offices at 3 Fenchurch street, E. C., to carry on the business of manufacturing india rubber, etc. This new enterprise has a capitalization of £5,000.

THE BRITISH ARMY AND RUBBER.

THE British soldier is today pretty thoroughly waterproofed from cap to shoes. He is protected against damp and inclement weather by rubber and rainproof garments, and in rain-soaked trenches wears rubber boots or waterproof foot gear. The standard army cap covers are khaki-colored cotton cashmere of single texture proof and fashioned to be close fitting to shed water. The standard motorcycle suits are made of woolen cashmere, double texture proofed. Sometimes olive sateen is used. Trench capes that have proved to be so necessary in this modern warfare are usually made of stout twill khaki, proofed single texture. Others are made of cotton-warp cashmere and dyed cotton cashmeres, single texture proofed. Trench waders are found to be very necessary and the standard equipment is made of khaki Indianas, double texture proof similar to the proofing used in good fishing stockings. If by chance the soldier happens to be a cavalrman, he is provided with a saddle cloth made up of double-warp khaki wigan—the government standard cloth and dye, double-texture proof. For watering his horse there is a folding rubber bucket made of durable gray twills or wigans. While in camp, troughs are provided for watering the horses and are made of very heavy and strong material with good proofing. The usual fabric is double-warp wigan, double texture proof. The standard ground sheets are of khaki double-warp wigan, single texture proof. Others are made of khaki sateens and gray wigan, single and double warp. The sleeping bags are made of brown canvas duck and brown twills, proofed double texture together. The officers' mackintoshes call for a material like cotton-warp cashmere or fawn heaverteen, proofed double texture. Stout twills of double texture are sometimes specified. The officers' hold-alls are made of khaki wigans or stout twills that are proofed double texture. Stretcher cloths are of brown canvas duck or common twills double-textured together, but not very well proofed. The ambulances are protected by covers made of dyed motor-duck twills, drills, or wigans. The proofing is double texture of hard motor proofing. In some cases rainproof ducks, such as yarned, dyed ducks are used. In the hospitals where bandages and surgical dressings are necessary the white jaconet, proofed very lightly, is used for a variety of purposes, such as bandages, bed sheetings, and operating room purposes. The bed sheetings are of the number one and two qualities, bleached, usually single proofed; but sometimes they are double-texture proofed where a special sheet is desired. Another quality is made up of single-warp wigan, and still another of double-warp wigan, single-texture proofed and double-faced with white and red rubber. Batiste cloths are sometimes used in place of jaconet and bed sheetings. It has been found that batiste is better because it is cleaner and can be washed. These are usually made of scoured fine cambrics or bleached cambrics, and proofed with a very fine coating of rubber on both sides with highly polished surfaces which are soft to the touch.

EXPORTS OF RUBBER GOODS FROM AUSTRALIA.

During 1914 the State of Victoria, Australia, exported £90,917 worth of rubber manufactured goods, compared with £76,788 in 1913; showing an increase of £24,129. Of these exports, in 1914, £76,388 worth were of Australian manufacture, while in 1913 the export of rubber goods of Australian manufacture amounted to £150,531; showing for 1914 an increase in value of £25,857.

H. A. Wickham, to whose enterprise the rubber planting industry in the East owes its origin and early development, and who has held various important appointments in the service of the British government, has since the outbreak of the war become attached to the Red Cross division of the Army Service Corps.

NO TIRE SCARCITY IN FRANCE.

In commenting on the tire situation in France the London "Commercial Motor" of May 20 contains the following paragraph: "It is evident that there is no shortage of solid and pneumatic tires in France, for the unlimited monthly contracts which were formerly given to all the leading tire makers have now been withdrawn and replaced by definite orders for determined quantities of casings and bands. This implies a big reserve stock in the hands of the army authorities."

It also contains the statement that late orders for trucks have been for delivery without tires, the intention evidently being to gradually convert the inch-size tires on American trucks to millimeter standards.

RUBBER AND COTTON COMMERCE AT HAVRE, FRANCE.

Havre is the second port in importance of France and, together with Bordeaux, handles large quantities of crude rubber and rubber manufactured goods, as well as considerable quantities of raw cotton. During 1914, 11,455 metric tons (metric ton = 2,204.6 pounds) of crude and reclaimed rubber were imported through Havre, while in 1913 these exports amounted to 18,367 tons, showing a decrease of 6,911.6 tons. During 1914 Havre exported 4,978.6 tons of crude and reclaimed rubber, against 8,496.3 tons in 1913; showing a decrease of 3,517.7 tons. While the exports of manufactured rubber through this port amounted to 861 metric tons in 1913, they only amounted to 571.8 tons in 1914; marking a decrease of 289.2 tons. The war, which affected the second half of 1914, accounts for these decreases.

Havre's most important trade is in raw cotton, the imports of which for the crop year 1913-14 reached 1,075,167 bales, as compared with 1,056,000 bales imported during 1912-13. Most of this cotton was imported from the United States.

THE RUBBER TRADE WITH SPAIN.

German publications report that Great Britain's efforts to capture Germany's rubber trade in Spain have met with total failure, partly on account of the strict rules British merchants have adopted and partly for the reason that the majority of the British traveling men sent to Spain are unable to speak the language of that country. Before the war at least one-third of the rubber goods used in Spain were supplied by German merchants and manufacturers, who feel hopeful that this proportion will be re-established at the close of hostilities.

A Russian decree which became operative in March last provides for the temporary increase of rates of duty on goods imported into that country other than those coming from France, Italy and Portugal, between which countries and Russia rates of duty are fixed by treaties. Differential rates are re-introduced in respect to various classes of goods imported over the European land frontier, these being in most cases 20 per cent. higher than the corresponding rates for goods imported by sea. Rubber is included in the list of goods on which specially increased rates are charged.

The commerce in rubber shoes between the United States and Smyrna, Turkey, in 1914, consisted in the import into Smyrna of \$150 worth of rubber footwear and the export of old shoes to the value of \$554. In 1913 there were \$1,071 worth of old shoes exported.

A new rubber sole patented in Germany is provided with a galvanized sheet iron edge, vulcanized with the sole and serving to attach it to the shoe or boot. [German patent No. 630,084.]

Replete with information for rubber manufacturers—Mr. Pearson's "Crude Rubber and Compounding Ingredients."

Earnings of German Rubber Workers.

It is to be noted that the cost of living in Germany in normal times is lower than in the United States. It is also true that German rates of wages are far below American averages. In 1913 the German Factory Workers Union investigated earnings among German rubber workers and published a comprehensive report, from which the following information was taken:

WAGES FOR TIME AND PIECE WORK.

Both men and women are employed in German rubber factories, but at widely differing wage scales, the average wages for women being about 50 per cent. below those paid to men. Whereas the lowest wages for men recorded in the German Factory Workers Union's report were 0.26 marks (6.1 cents) per hour, paid to operators of punching machines, the lowest wages for women recorded were 15 pfennigs (3.5 cents) per hour. The highest wages paid to men, on time work, were 0.5605 marks (13.3 cents) per hour (paid to makers of electrical sundries). The highest wages paid to women were 33.5 pfennigs (8 cents) per hour.

Quite a little piece and contract work was done by both men and women workers in German rubber factories and in both cases earnings under this system were, generally speaking, somewhat higher than time wages. Less contract work was given to women than to men because, according to the report, it was found impracticable, as a rule, to have women work on contract basis.

The lowest earnings recorded for piece work for men were 0.30 marks (7.1 cents) per hour, for washers in the mechanical goods department, while the highest wages for piece work were 0.735 marks (17.5 cents) per hour, paid to men engaged in the preparation of raw rubber.

For contract work earnings ranged from 8 cents (for making conveyor and transmission belts) to 19 cents per hour, paid to polishers in high-class comb factories.

WORKING HOURS.

Working time varied considerably in the different factories, ranging from 46 to 61½ hours per week. Of the 86 factories investigated and covered by the labor union's report, only 4 worked their factory hands 60 or more hours per week, and the average time for the 27,063 men and women employed in these factories was 55½ hours per week. Twenty-nine per cent. of these workers labored more than 55½ hours per week, while 29.32 per cent. of them worked 54 hours per week, or 9 hours per day. The working time for the first five days of the week varied from 7½ to 10½ hours per day, and for Saturdays, from 4 to 10½ hours. In 25 German rubber factories work began at 6 A. M. and ended at 6 P. M. In 23 of them it began at 7 A. M., ending at 6 P. M. From 10 to 30 minutes was the average time allowed workers for breakfast, from 30 minutes to 2 hours for the noon meal and from 10 to 30 minutes was generally given for tea; this for the first 5 days of the week. On Saturdays, when working time was slightly shorter than on the other days, these recesses were also shorter.

OVER TIME WAGES.

In 6 German rubber factories over time was paid for at the same rates as the regular hours and was not counted until 7 P. M. One factory counted over time from 8:15 P. M. and quite a number of factories had special over-time wages from 5 to 10 cents (about 2 cents) higher than regular hour wages.

APPRENTICESHIPS.

The report states that work has been specialized to such an extent in German rubber factories that it is easy for men to become experts in their work, and many firms no longer have

apprentices receiving "learners' wages." Some factories, however, continued to exact long apprenticeships during which new men worked under expert workmen. These apprentices were paid wages ranging between 8.84 marks (\$2.10) and 36.00 marks (8.57) per week, but these amounts they were required to divide with their instructors, who received in some cases one-half, and in others one-third of the apprentice's pay. There were a few lines in which the apprentice was obliged to turn over his whole pay to his instructor.

HOLIDAYS.

Holidays, as a rule, are not paid for in Germany. Fourteen rubber factories of the 86 reported on, paid partial wages on holidays to workmen and workwomen who had been with them for at least three years. Three firms paid full salaries on holidays, one allowed half pay to workers three years in its employ and full pay to those who had been with it for at least five years.

DIVISION OF LABOR.

Men are employed in all branches of the German rubber industry, whereas women are employed only in certain departments. In such work as storing raw materials, washing raw rubber, drying raw rubber and the like, only men are engaged.

TABLES SHOWING WEEKLY WAGES IN GERMAN RUBBER FACTORIES.

The following tables show the minimum and maximum average weekly wages for male and female adults employed in the 86 German rubber factories reported on by the German Factory Workers Union:

WAGES PAID MEN.

Nature of Employment.	Average Weekly Wages.			
	Minimum.		Maximum.	
	Equivalent in Marks.	Equivalent in Dollars.	Equivalent in Marks.	Equivalent in Dollars.
HANDLING RUBBER WASTE				
Sorting	16.18	\$3.85	22.76	\$5.42
General (not classified)	22.10	5.26	24.94	5.94
PREPARATION OF CRUDE MATERIALS				
Washing rubber	10.87	\$4.97	23.70	\$5.64
Drying rubber	20.68	4.92	24.72	5.88
Mixing	21.42	5.10	27.65	6.58
Calendering	25.15	5.99	31.29	7.45
General (not classified)	20.00	4.76	27.39	6.52
MAKING MECHANICAL GOODS.				
Rubber sheeting	18.96	\$4.51	28.00	\$6.66
Transmission and conveyor belts	20.52	4.88	31.26	7.41
Accessories	18.00	4.28	21.00	5.00
All hand work	19.62	4.67	26.95	6.41
All machine work	19.70	4.69	26.45	6.29
Hand and machine work combined	18.56	4.42	25.47	5.06
Vulcanizing	21.31	5.07	27.43	6.53
MAKING HOSE.				
Hand work	19.51	\$4.64	25.77	\$6.13
Machine work	19.34	4.60	25.91	6.17
Hand and machine work combined	18.61	4.43	26.06	6.20
INNER TUBES AND CASINGS.				
Automobile inner tubes	21.60	\$5.14	23.80	\$5.66
Automobile casings	21.11	5.02	27.92	6.65
Automobile tire repairs	23.30	5.55	27.68	6.59
Cycle inner tubes	20.05	4.77	25.96	6.18
Motor cycle casings	24.00	5.71	30.00	7.14
Solid tires	22.48	5.35	28.01	6.67
Specialists (sewing)	21.24	5.06	23.50	5.59
Vulcanizing	21.40	5.09	25.33	6.03
Finishing	18.82	4.48	23.85	5.68
General (not classified)	10.87	4.97	25.38	6.04
SURGICAL RUBBER GOODS.				
Patent rubber blocks	24.00	\$5.71	28.25	\$6.72
Patent rubber goods	11.62	5.15	27.68	6.59
Surgical goods	21.13	5.02	28.50	6.78
Sponges	23.00	5.47	26.67	6.35
DIPPED GOODS.				
Nipples	20.25	\$4.82	25.88	\$6.16
Preservatives	21.09	5.02	22.20	5.28
Miscellaneous	20.92	4.98	27.92	6.64
RUBBER FRASERS.				
General	17.33	\$4.12	25.83	\$6.15

BALLS, DOLLS, ANIMALS, ETC.				
General	18.75	\$4.46	2.25	\$5.30
RUBBER FOOTWEAR.				
General	20.17	\$4.80	2.50	\$5.07
PAINTED GOODS.				
Painting and finishing	20.43	\$4.86	3.03	\$5.09
Making up	21.00	5.00	2.00	5.47
CABLE AND INSULATED WIRE.				
General	21.50	\$5.21	2.00	\$5.40
MISCELLANEOUS SMALL RUBBER GOODS.				
General	19.53	\$4.64	2.13	\$5.74
HARD RUBBER GOODS.				
Sticks and tubes	23.71	\$5.64	2.57	\$6.32
Sheets and plates	24.21	5.76	2.93	6.63
Insulations for electrical goods	29.30	6.97	35.00	8.33
Mechanical and surgical goods	19.35	4.61	2.78	6.37
Vulcanizing	23.56	5.61	29.94	7.13
Grinding	18.55	4.41	14.43	5.81
Rubbing with pumice stone	16.62	3.96	22.50	5.35
Turning	21.07	5.16	28.37	6.75
Machining and threading	21.50	5.12	26.00	6.19
Polishing	19.06	4.54	23.92	5.94
Punching	14.00	3.33	24.00	5.71
COMBS.				
Grinding	16.00	\$3.81	25.00	\$5.95
Cutting	16.00	3.81	30.00	7.14
Wrapping	21.00	5.00	30.00	7.14
Rubbing with pumice stone	18.00	4.28	23.00	5.47
Washing and brushing	18.00	4.28	24.00	5.71
Polishing	18.00	4.28	24.00	5.71
Finishing	18.00	4.28	24.00	5.71
Marking and gilding	17.00	4.05	25.00	5.95
Packing in tinfoil	22.00	5.24	27.00	6.43
GUTTA PERCHA GOODS.				
Preparation of raw materials	20.40	\$4.86	23.46	\$5.58
Making mechanical goods	20.06	4.77	27.33	6.59
STORAGE AND SHIPPING.				
Case and box makers	19.00	\$4.52	28.00	\$6.66
Inspectors	24.00	5.81	30.00	7.14
Freight handlers	20.39	4.85	26.45	6.29

WAGES PAID WOMEN.

Nature of Occupation.	Average Weekly Wages.			
	Minimum.		Maximum.	
	Equivalent in Marks.	Equivalent in Dollars.	Equivalent in Marks.	Equivalent in Dollars.
HANDLING RUBBER WASTE.				
Sorting	10.75	\$2.56	12.00	\$2.86
Reclaiming (general)	11.00	2.62	13.00	3.09
PREPARATION OF CRUDE MATERIALS.				
Mixing	11.00	\$2.62	14.30	\$3.40
General	12.00	2.86	12.50	2.97
MAKING MECHANICAL GOODS.				
Plates and sheets	10.50	\$2.50	15.00	\$3.57
Transmission and conveyor belts	12.32	2.93	14.60	3.33
Rubber heels	9.00	2.14	12.00	2.86
Miscellaneous—				
Hand work	10.36	2.47	13.69	3.26
Machine work	10.75	2.56	14.45	3.44
Hand and machine work combined	10.06	2.39	11.99	2.85
Vulcanization of mechanical goods	10.09	2.38	12.00	2.86
MAKING HOSE.				
Hand work	9.98	\$2.38	13.56	\$3.23
Machine work	10.82	2.58	14.78	3.52
Hand and machine work combined	11.15	2.65	15.14	3.60
MAKING TIRES.				
Automobile inner tubes	11.88	\$2.83	13.46	\$3.20
Automobile casings	11.80	2.81	13.88	3.30
Reeliners (tires)	11.55	2.75	13.90	3.31
Cycle inner tubes	11.72	2.79	14.20	3.38
Cycle casings—				
Sewing	12.75	3.03	14.83	3.53
Glueing	10.00	2.38	12.50	2.98
Finishing	11.40	2.71	12.40	2.95
DRUGGISTS' SUNDRIES AND SURGICAL GOODS.				
Surgical goods	11.30	\$2.69	16.28	\$3.87
Druggists' sundries	10.59	2.52	16.15	3.84
Rubber sponges	14.00	3.33	19.00	4.52
DIPPING GOODS.				
Nipples	9.00	\$2.14	17.00	\$4.05
Miscellaneous	11.62	2.77	16.67	3.97
Toy balloons and rubber jokes	11.20	2.69	13.23	3.15
RUBBER ERASERS.				
General average	11.00	\$2.62	15.00	\$3.57
BALLS, DOLLS, ANIMALS, ETC.				
General average	10.47	\$2.49	12.48	\$2.97
RUBBER FOOTWEAR.				
General average	11.70	\$2.78	14.00	\$3.33
MISCELLANEOUS.				
Spreading	11.12	\$2.65	15.97	\$3.80
Making up	11.07	2.64	15.67	3.73
Dress shields	9.00	2.14	13.56	3.23

INSULATING CABLES.				
General average	12.00	\$2.86	18.00	\$4.28
HARD RUBBER GOODS.				
Insulation for electrical goods	14.00	\$3.33	.....	.....
Mechanical and surgical goods	10.05	2.39	13.00	\$3.09
Vulcanizing	9.00	2.14	14.40	2.71
Grinding	10.00	2.38	13.00	3.09
Turning	11.20	2.67	16.33	3.89
Polishing	10.71	2.55	13.47	3.21
COMBS.				
General average	10.50	\$2.50	12.50	\$2.98
Finishing	10.00	2.38	12.00	2.86
GUTTA PERCHA GOODS.				
Preparation of raw materials	12.00	\$2.86	12.00	\$2.86
Mechanical goods	10.50	2.50	12.00	2.86
WAREHOUSES AND SHIPPING.				
Box making (cardboard)	9.00	\$2.14	16.00	\$3.81
Inspection	11.00	2.62	14.40	3.43
Shipping	11.75	2.79	14.01	3.33

THE RUBBER TRADE IN GERMANY.

THE Germans, being a philosophical people and fond of intellectual deductions, are speculating as to what result the war will have, after it is all over and peace once more established, on rubber manufacture and other industries.

The pessimists take the attitude that the tremendous loss of men in killed and incapacitated must seriously retard German industrial progress for many years to come. The optimists, on the other hand, prophesy that with the return of peace there will begin an era of unparalleled activity in the industrial and commercial life of the Empire. They contend that they have already learned many extremely valuable lessons from the war, particularly in the direction of creating their own supply of crude materials, and thus of insuring their independence of the rest of the world. They admit that there will be an embarrassing shortage of labor, but this, they say, will result in a rapid and general improvement in mechanical devices and their more extended use. It may be that goods will cost more but they will be vastly improved in quality.

NEW GERMAN RUBBER EMBARGO.

The German Imperial Chancellor published, on June 8, a new order that supersedes all previous orders regarding rubber, gutta-percha and balata. The new order prohibits both the exportation and the transit of rubber, gutta-percha and balata, crude or manufactured, including rubber substitutes, waste and scrap rubber; rubber and gutta-percha cements, rubber oil, all goods containing either soft or hard rubber, and all soft and hard rubber articles. A proviso of the new order states that permission to export will be granted for certain goods provided it be proved that other goods containing one and one-half times as much rubber as the exported article will be imported in exchange.

TIRE STANDARDS AND WAR.

The European war has brought home to all the nations engaged in it the importance of standardization of tire sizes and the limitation of these to the smallest number possible. Germany, for instance, has discovered that seven different dimensions of automobile tires meet all requirements. Before the war at least thirty different sizes were used in the German Empire, and the German authorities report that fully 40 per cent. of the tires in stock in the country on August 1 last were found to be in odd sizes suited to only a small number of machines, the greater number of automobiles not being able to use them. Such conditions certainly call for a remedy, for they are contrary to the interests of the whole country, not only in war times, but also in time of peace. Manufacturers are obliged to make, and dealers to carry in stock, quantities of tires rarely wanted. For all this waste the consumer has to pay, and further he is often at a loss to know exactly the size he wants for his machine.

Should be on every rubber man's desk—Crude Rubber and Compounding Ingredients; Rubber Country of the Amazon; Rubber Trade Directory of the World.

GERMAN MILITARY USES OF MOTOR VEHICLES.

A recent issue of the "Kölni-Zeitung" contains an interesting article on the various ways in which the motor vehicle has been used in German military operations. The more important of these uses are covered in the following paragraphs.

Since the outbreak of the war the manufacture of tires has been the most important item in the German rubber industry. The fact that Germany's isolation from the sources of supply of crude rubber has obliged the German government to prohibit the use of crude rubber for other than military purposes is largely responsible for this state of affairs, but it cannot be denied that under modern war conditions motor vehicles make the chief demand on the resources of the rubber industry. Everybody knew that automobiles and motor trucks would play an extremely important part in modern warfare, but no one could foretell the enormous demand for rubber tires this war has brought about. The tire manufacturers, however, were quick to meet the emergency and there apparently has been no shortage of this commodity that can be attributed directly to the manufacturers.

Most of the motor vehicles used in the present war are former pleasure cars of which there was a far greater number than there was of motor trucks when the war broke out. Powerful cars with large tires best answer the purposes of the belligerents and consequently this type of car is found with the armies in far greater numbers than are low powered machines. Some of these automobiles have retained the luxurious bodies they had in times of peace and are used by the general staffs. Others lost their former bodies and were fitted out with heavy armor. Others still received bodies suitable for the transportation of troops and munitions. The heavy duty imposed upon the cars by war conditions and the fact that reliability is essential has led most of the warring nations to fit those of their automobiles using pneumatic tires with dual or twin tires on the rear wheels.

The transportation of wounded and sick soldiers is perhaps the most important and most extensive service motor cars are asked to perform in the present war. Most of these motor ambulances are provided with heavy pneumatic tires with twin tires on the rear wheels. They are required to follow schedules that demand an average speed of about twenty miles an hour, and this, especially on war-worn roads, means an enormous consumption of pneumatic tires.

Motor ambulances are generally provided with seats for driver and assistant and for a few slightly wounded men, while room is left for the stretchers that bear the more severely wounded. Almost all the motor ambulances carry a first-aid pharmacy. Motorcycles with sidecars attached are also extensively used for ambulance service. These light vehicles are often able to go much nearer to the firing line than it is possible to take larger machines. Each of these motorcycle ambulances runs on three pneumatic tires and carries two or more spare tires and tubes—as do all the army motors provided with pneumatics. Many of the larger motor ambulances have trailers. These increase the carrying capacity of the motors per unit; and they also increase tire consumption owing to the fact that they themselves are equipped with two and sometimes with four tires.

The German army has even been provided with motor altars or field chapels. These are complete church altars, with all their equipment, mounted on automobiles. These motor altars have pneumatic tires, which enable them to travel rapidly from one place to another and thus multiply the services of the minister by consisting them.

Automobile searchlights play a very important part in assisting night movements and operations of troops. Automobile searchlights, like automobile wireless stations, are mounted on

powerful cars equipped with pneumatic tires. Rubber tired automobiles carry the anti-aircraft guns, and even aeroplanes themselves are transported on motor vehicles with rubber tires. The full extent of the use of automobiles, motor trucks and rubber tires in this war will not be known until the great struggle is over.

GERMAN CRUDE RUBBER COMPANIES.

Almost all of the German crude rubber producing companies have availed themselves of a decree of the German Confederation Assembly exempting them from the obligation of presenting accounts and holding general meetings covering the year 1914. The Sapata Somoa Co., the Cameroon Rubber Co., the East African Plantations Co., and the Bismarck Archipelago Co. presented no accounts and have held no meetings. A few German plantation companies, however, have held general meetings and presented reports to their shareholders, among them the two mentioned below.

GERMAN EAST AFRICA CO.

This company reported that the outlook for 1914 was exceedingly bright until the war destroyed all the hopes of the directors. Several of the company's cargoes were seized at sea by the Allies' ships. Only one cargo of rubber and hemp was able to reach Naples. That was sent overland to Germany. The company paid no dividends.

MEANJA RUBBER PLANTATION CO.

The Meanja company, Berlin and the Cameroons, stated that on November 14 all the German employees on the company's plantations were seized by the British and French forces, together with two-thirds of the 1914 crop. The Imperial Colonial Secretary had promised to indemnify the company for its losses. No dividend was paid by this company, which for 1913 paid a cash dividend of 5 per cent.

DEVELOPMENT OF RUBBER PLANTATIONS ON THE EAST COAST OF SUMATRA.

A report published by the Chamber of Commerce of Medan, Sumatra, states that on January 1, 1915, the total area under *Hevea* in the districts of the east coast of Sumatra amounted to 245,000 acres, of which 55,000 were producing. In 1902 the area planted in *Hevea* in these districts amounted to 435 acres; in 1905, there were 5,110 acres; in 1910, 73,826 acres, and by 1914, 245,000 acres on the east coast of Sumatra were planted in *Hevea*. The following table shows the kinds and quantities of crude rubber exported from the east coast of Sumatra during 1913 and 1914, also the increase or decrease in these exports:

	1913.	1914.	+ = Increase, - = Decrease.
<i>Hevea</i> tons	6,561,687	10,672,696	+ 4,111,309
<i>Poly</i> and other tons	981,455	836,978	- 144,477
Wild rubber tons	30,353	22,433	- 7,920
Total tons	7,573,495	11,532,107	+ 3,958,612

No statistics are at present available regarding the destination of the above exports, but the following table shows the destination, quantities, increase and decrease of crude rubber exports from the port of Bilah, east coast of Sumatra, during the years 1913 and 1914.

To	1913.	1914.	+ = Increase, - = Decrease.
Holland tons	1,001,863	985,747	- 16,116
England tons	3,743,181	5,531,813	+ 1,788,632
Germany tons	61,470	59,731	- 1,739
Belgium tons	266,310	150,341	- 115,969
United States tons	130,753	782,030	+ 651,277
France tons	17,653	26,050	+ 8,397
Total tons	5,221,230	7,535,712	+ 2,314,482

In a recent issue the "Times of Ceylon" comments on a form of rubber stealing that has become serious in certain producing districts, the trees being tapped over night and the latex carried away, as many as 500 trees sometimes being illicitly tapped in a single night.

PLANTATION RUBBER'S VULCANIZING CAPACITY.

By Our Eastern Correspondent.

AS a result of experimental work carried out in the vulcanizing and testing laboratory established not long ago in Malaya by the Agricultural Department of the Federated Malay States, B. J. Eaton and J. Grantham have arrived at certain important conclusions on the subject of variability of plantation rubber, which have been embodied in a paper recently published in the "Agricultural Bulletin."

They point out that during the last two or three years much has been written and many statements made concerning variation in plantation Pará rubber. The opinions expressed generally by manufacturers are to the effect that variation is considerable, even in the case of "first latex" rubbers when compared with fine hard Pará as the highest grade of wild Pará rubber. On the other hand, leading rubber technologists and chemists have maintained that the best grades of plantation Pará rubber, especially sheet, are superior to fine hard Pará. According to Eaton and Grantham both opinions may be taken as correct and are not necessarily contradictory. Unfortunately, neither the statements made by manufacturers nor the published results of experiments carried out by rubber chemists have indicated the nature of this variation; still less have any published results enabled us to attribute this variation to any definite cause.

It is particularly noteworthy that Eaton and Grantham combat the familiar notion that variability refers only to those properties of rubber which may be tested by physical means. The general assumption, they state, that variation refers to differences in the mechanical properties of the raw or vulcanized rubber, i. e., strength, elasticity, etc., is only true to a limited extent among "first latex" rubbers and represents only a part of such variation.

It is claimed by the authors of the paper that these experimental results are the first, so far as the writers are aware, which have indicated the most important variation in plantation Pará rubber, namely, its variable vulcanizing capacity.

Importance is also attached to the fact that the authors were acquainted with the entire history of their samples—a condition impossible of realization to chemists and scientists resident in Europe.

SUMMARY OF RESULTS.

According to the summarized results given at the conclusion of the paper, it is found that considerable variation occurs in plantation Pará rubbers, both from the same estates and from different estates. This variation is connected principally with the behavior of the rubber on vulcanization, i. e., its rate of cure, and not in respect to its strength, elasticity and general mechanical properties; especially in the case of properly prepared "first latex" samples. If the rate of cure be known or ascertained under specific conditions, vulcanized rubber, having similar mechanical properties, can be made from all good samples of "first latex" rubbers. The differences in mechanical properties are not so important to the manufacturer as the differences in rate of cure and are not of the same order. The rate of cure is due to the presence of some non-caoutchouc substance in the latex, possibly the proteins or some other constituent. This substance may be already present in the latex, and its amount in the raw rubber determined by the mode of preparation and coagulation, or it may be subsequently formed in the latex by decomposition, or it may be formed in the coagulum. The alternative theories await investigation.

Another of the conclusions arrived at appears to be worthy of special note: "The rate of cure of a rubber under specified conditions is not indicated in any way by the apparent mechanical, or any other apparent properties of the raw material; hence the absurdity of the present methods of valuation of rubber. A manufacturer probably prefers a rapidly curing rubber, as it represents economy in heat, labor and time costs; and secondly, a rubber which cures rapidly is said to have better keeping qualities under

vulcanization. Rapidly curing samples should therefore obtain a premium in the market and probably would if valuation were carried out on a scientific basis, provided uniformity in rate of cure be maintained at the same time."

It is thought that uniformity between "first latex" rubbers from different estates will be very difficult of attainment with present methods, but should not be difficult of solution among such rubbers from the same estate. Two alternatives are suggested, (a) the issue of certificates giving the correct rate of cure and the mechanical properties at this cure, and (b) the attainment of more uniformity by a method in which rubber from latex collected during a series of days forms part of one ball or block, which may be described as the method of averages.

STRAITS SETTLEMENTS RUBBER EXPORTS.

An official cablegram from Singapore announces that the export of plantation rubber from the Straits Settlements ports during the month of June amounted to 2,249 tons, as compared with 3,588 tons in May and 1,480 tons in the corresponding month last year.

The following is a comparative table showing the export for three years:

	1913.	1914.	1915.
January	784	1,181	2,576
February	743	1,703	2,741
March	898	1,285	2,477
April	762	1,548	1,978
May	814	1,309	3,588
June	812	1,480	2,249
Total	4,813	8,506	15,609

These figures include transshipments of rubber from various places in the neighborhood of the Straits Settlements, such as Borneo, Java, Sumatra and the non-Federated Malay States, as well as rubber actually exported from the Colony, but do not include rubber exports from the Federated Malay States.

FEDERATED MALAY STATES RUBBER EXPORT.

An official cablegram received from Kuala Lumpur announces that the export of plantation rubber from the Federated Malay States during the month of June amounted to 3,403 tons as compared with 2,708 tons in May last and 2,306 tons in the corresponding month last year.

The following is a comparative table showing the export for three years:

	1913.	1914.	1915.
January	2,131	2,542	3,473
February	1,757	2,364	3,411
March	1,737	2,418	3,418
April	1,626	2,131	2,777
May	1,225	2,069	2,708
June	2,005	2,306	3,403
Total	10,481	13,850	19,190

EXPORTS OF RUBBER AND COTTON FROM FRENCH INDO-CHINA.

During 1914 exports of crude rubber from French Indo-China amounted to 397,522 pounds as compared with 338,589 pounds exported during the previous year; showing an increase of 58,933 pounds. Of these total exports of crude rubber 297,161 pounds of plantation rubber and 792 pounds of wild rubber were shipped to France, and 100,283 pounds of plantation rubber were shipped to Singapore.

The total exports of cotton amounted to 10,024,978 pounds in 1914, as compared with 18,482,471 pounds in 1913; showing a decrease of 8,457,493 pounds.

Exports of rubber from French West Africa have fallen off during the past few years, amounting in 1913 to only \$3,049,555, as against \$5,064,000 in 1912 and \$5,852,000 in 1911. Rubber is prohibited export from this district in any other form than thin slabs, and in order to encourage commerce in this product the government has recently lowered the export duty.

1950-1951 NF 15, 1915.

Re-Issue.

ISSUED JUNE 22, 1913

Re-Issue.

RECEIVED JUNE 29, 1915.

ISSUED JULY 6, 1915.

ISSUED JULY, 13, 1915.

Re-Issue.

13,945. Weather strip for automobile wind shields. A. L. McCormick, Kansas City, Mo.

PATENT SPECIFICATIONS PUBLISHED.

The number given is that assigned to the Patent at the filing of the application, which in the case of these listed below was in 1914.

LAUREL, SEE IN THE ILLUMINATED OFFICIAL JOURNAL, IN

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, JUNE 16, 1915.]

4,139 (1914). Rubber heel pad. G. Cummings, Bleak House, Gosforth, Northumberland.

4,263 (1914). Vulcanizing india rubber. S. J. Peachey, 8, Halesden Road, Heaton Chapel, Stockport.

4,283 (1914). Tire vulcanizer. H. C. Reading & Co., Burton Motor Garage, High street, and G. E. Sutton, 88, Belvedere Road—both of Burton-on-Trent.

4,293 (1914). Repairing rubber articles. S. Wilson, Robsart street, Parkside, South Australia.

4,313 (1914). Tire vulcanizer. W. H. Miles, Woolpack Hotel, Langton, Staffordshire.

4,423 (1914). Bottle stopper. G. A. Schulz, 11, Grosse Kirchstrasse, Grunberg, Silesia, Germany.

4,451 (1914). Emulsion formed as an intermediate caoutchouc product. Frankel & M. Runge, 19, Lazarusstrasse, and W. Golombek, 33, Klosterstrasse—both in Spandau, Germany.

- 4,457 1914. Vehicle wheel axles. E. Faber, 49, Bartholomäustrasse, Berlin.
- *4,557 1914. Tire motor case. O. Gray, Little Rock, Ark., U. S. A.
- 4,570 1914. Wheel tire. M. W. Link, "Michiase," St. Kella street, Melbourne, Brighton, and A. M. Kishido, 18, Greenway, Kew, both near Melbourne, Australia.
- *4,723 1914. Motor vehicle wheels. R. H. R. Schmidt, Cleveland, Ohio, and E. L. Roberts, Trenton, N. J., both in U. S. A.
- *4,953 1914. Vehicle wheel. E. L. Z. Co., 10, Avenue K, Birmingham, Ala., U. S. A.
- *4,964 1914. Vehicle wheel. J. W. Leonard, Cincinnati, New York, U. S. A.
- 4,745 1914. Winding web, wire, etc. W. Player, 54, Calverley street, Eghington, and W. Brace, 37, High street, Smethwick, Birmingham.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, JUNE 3, 1915.]

- 4,889 1914. Telescope in which the body portion is of rubber. E. Reif, Gorz, Austria.
- 4,954 1914. Rubber lined fabrics. W. F. Mintz, 6, Breems Buildings, Chancery Lane, London.
- 5,017 1914. Non-slipping shoe tread. A. Hull, 150 Boulevard Anspach, Brussels.
- 5,113 1914. Rubber in moisture absorbing appliances for pianos, etc. C. L. Killar, 4, Holly Village, Swans Lane, Highgate, London.
- 5,119 1914. Apparatus for closing tire punctures. W. G. Windham, 39, Evelyn Gardens, London.
- 5,259 1914. Garters for supporting an air tube at a weak part of the cover. J. L. McGuire, 140, Stanhope street, Newcastle-on-Tyne.
- 5,299 1914. Rubber heel pad. J. Girard, 16, Rue Saint-Léonard, Marseilles, France.
- 5,464 1914. Rubber belting and packing machine. P. M. Matthew, Victoria Rubber Mills, Edinburgh.
- 5,461 1914. Air tubes and chambers for wheel tires. H. Mustiere, 4, Boulevard Pétrelle, Paris.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, JUNE 30, 1915.]

- 5,571 1914. Necktie, stiffened by rubber strips. W. Hey, 6 Grimstone Terrace, Hull Road, York.
- 5,633 1914. India rubber substitutes; coated and compound fabrics. Akt.-Ges. für Anilin-Fabrikation, Treptow, near Berlin.
- 5,746 1914. Breathing apparatus. A. B. Dräger, 53 Morslinger Allee, Lübeck, Germany.
- 5,809 1914. Elastic bandage. L. H. Shortle, 8 Green Road, Southsea, Hants.
- 5,948 1914. Necktie. J. G. Frame and J. A. Swool, 472 Bathurst street, Toronto, Ont., Canada.
- *5,962 1914. Tire rim. P. B. Bosworth, 645 Summer street, Akron, Ohio, U. S. A.
- *5,963 1914. Tire rim. P. B. Bosworth, 645 Summer street, Akron, Ohio, U. S. A.
- *6,063 1914. Cutting tires. A. Greenwell and F. W. Rembold, Owensboro, Ky., U. S. A.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, JULY 7, 1915.]

- 6,114 1914. Wheel tire. J. E. Serster, 83 Rue de Wautier, Laeken-Brussels.
- 6,187 1914. Rubber sleeve for vehicle window weather bars. M. Ritter, 10 Canalettostrasse, Dresden, Germany.
- *6,203 1914. Rubber protectors for footwear. J. G. Thibault, 1217 East avenue, Elyria, Ohio, U. S. A.
- 6,215 1914. Coagulating rubber latex. A. Woosnam, 70 New Court, Lincoln's Inn, London.
- 6,216 1914. Cementing press for footwear. Continental Caoutchouc und Gutta Percha Cie, Hanover, Germany.
- 6,287 1914. Wheel tire. C. H. May, 30 John Bright street, Birmingham.
- 6,259 1914. Vehicle wheel with rubber tread. T. W. Brown, City Chambers, Clifford street, York.
- 6,271 1914. Boots, etc. L. Kröpf, Villa Bayer, Karlbad, Austria.
- 6,290 1914. Vehicle wheel; spring. F. Murray, 62a Queen's Road, Bayswater, London.
- 6,296 1914. Rubber or rubber faced wheel guard and obstruction remover. H. Conrad, 19 Tibbsleet Road, Cricklewood, London.
- 6,318 1914. Regenerating air for breathing. A. B. Dräger, 53 Morslinger Allee, Lübeck, Germany.
- 6,407 1914. Rubber covered playing bowl. J. D. Watson, 80 Churchill Road, Great Yarmouth, Norfolk.
- 6,418 1914. Electric condenser. Allgemeine Elektrotechnik Ges., 2 Friedr. Karl Ufer, Berlin.
- 6,457 1914. Bottle stopper. L. de Wit, 110 Avenue des Petits-Céps, Antwerp, Belgium.
- 6,470 1914. Knitting machine for elastic stockings. C. Claringburn, 194 Noel street, Hyson Green, Nottingham.
- 6,489 1914. Instand. M. J. Webb, Carmel House, St. Alphonsus Road, Drumcondra, Dublin.
- 6,517 1914. Wheel tire. R. I. Henderson, 399 Markham street, Toronto, Ont., Canada.
- 6,591 1914. Wheel tire. R. I. Henderson, 399 Markham street, Toronto, Ont., Canada.
- 6,640 1914. Wheel tire. H. Wipfel, 29 Tiedexerstrasse, Einbeck, near Hannover, and Reform Pneumatik "System Wipfel" Ges., Hannover, Germany.

NEW ZEALAND.

[ABSTRACTED IN THE PATENT OFFICE JOURNAL, JUNE 10, 1915.]

- 35,766 1915. Expressing oil juice of pond from seeds, and materials and substances generally which contain oil juice, and a method also adapted for producing shaped blocks of pieces from plastic materials, etc. J. L. Hunter, 157, Featherston street, Wellington, New Zealand.
- 36,073 1915. Garter. E. H. Reid, "Chaldon Hill," Ellinbank, Victoria.

THE FRENCH REPUBLIC.

PATENTS ISSUED (WITH DATES OF APPLICATION)

- 475,120 (January 9, 1914). Process and arrangement for manufacturing rubber balls with, etc., in the piece, on a grid machiné. Société Française de Caoutchouc, Montsouris.
- 475,164 (June 16). Rubber tire for vehicle wheels. H. B. Collette.
- 475,351 (July 17). Detachable rim for road rubber tires. M. Polak.
- 475,351 (February 11). Improved non-inflammable plastic substances. Compagnie Générale des Établissements Pâte Frères.
- 475,360 (February 14). Metalloplastic packing and process for manufacturing same. M. Varrault.
- 475,405 (May 28). Improvements in automobile and other wheels. E. F. Goodyear.
- 475,438 (February 11). Method for manufacturing a ring, band or bracelet with diagonal threads, for pneumatic tires. F. Boudin.
- 475,452 (July 20). Elastic wheel. Smith Spring Wheel Co.
- 475,504 (July 10). Process for manufacturing an elastic substance to be used in the making up of bandages and other articles. Barmèche.
- 475,506 (July 21). System for fixing rubber rings to pneumatic tire and other valves. Schrader's Sons, Incorporated.
- 475,541 (July 20). Improved detachable rims. Lightning Lock Demountable Rim Co.

[NOTE: Printed copies of specifications of French patents can be obtained from R. Babet, Ingenieur-Conseil, 16 avenue de Villiers, Paris, at 50 cents each, postpaid.]

THE GERMAN EMPIRE.

PATENTS ISSUED (WITH DATES OF VALIDITY).

- 285,138 (October 12, 1912). Process for manufacturing waterproof cloth and other materials. Frank E. Batrows, Washington, D. C., U. S. A.
- 285,745 (February 1, 1914). Injector. Dr. Charles A. Tyrrell, New York, N. Y., U. S. A.
- 286,118 (June 19, 1911). Method for correcting flaws in rubber goods. Wilhelm G. Rudolph, Frankfurt-on-the-Main.
- 286,260 (January 26). Balloon fabric. Metzler & Co., Munich.

THE MARKET FOR CHEMICALS AND COMPOUND-INGREDIENTS.

THE continued uncertainty of the supply of imported raw materials used in the manufacture of rubber chemicals and ingredients has had a disturbing influence on the July market. Metal lead was steady during the early part of the month and zinc oxide has not recorded any more remarkable changes. The price of lithopone was firm and considerable foreign stock was offered to the trade. As the month progressed the situation did not improve from the buyer's standpoint.

Some competition was noticed in barytes, caused by the offering of samples from Australia. Just how much competition that country can offer remains to be seen. The supplies of chalk are not sufficient to ease the market to any extent and whiting is consequently very firm in price. China clay is likely to go to higher figures on account of unfavorable shipping conditions. By the end of the month, market conditions had not changed as far as lead and zinc pigments were concerned. Several of the dry colors were difficult to obtain and the shipping situation continues to be a large factor in supplies that depend upon imported foreign materials.

The cost of acetate of lime has resulted in an advance in acetone, and in spite of the absolute embargo placed on glycerine by Great Britain the price remains unchanged. Acetic acid is in demand for export and the domestic market is firm with prices slightly higher in sympathy with the high prices of acetate of lime. It is reported that aniline oil is becoming difficult to obtain and the spot supply has been drawn on heavily during the past few weeks. The benzol situation seems to be easier and if the new plants which are being erected for the manufacture of this by-product are successful a new competitor for gasolene as a motor spirit will have been created.

It is evident from government statistics that drug supplies are at the lowest point in the history of the trade. This is shown

NEW YORK'S importers, who claimed that the 2000 seizures of furs returned by the appraiser were overvalued and paying a 15 per cent ad valorem, has been ruled.

EXTRACTS FROM COMMISSIONS AND COMPOUNDING INGREDIENTS
NEW YORK, JULY 5, 1935

Saffron, flowers .....	.....	1.00	a
Saffron, dried .....	.....	1.25	a
Silk, American .....	.....	12.00	a
French .....	.....	21.00	a
Tahiti, pure .....	.....	1.50	a
Triphite earth, powdered .....	.....	50.00	a
"baked" .....	.....	10.00	a
Turpentine, pure gum, spirits .....	.....	.44	a
wood, Best .....	.....	.38	a
Ultramarine, blue .....	.....	.05	a
Vermilion, brilliant .....	.....	.50	a
Chinese .....	.....	.75	a
English .....	.....	1.35	a
Wax, bayberry .....	.....	.22	a
beeswax, white .....	.....	.40	a
ceresin, white .....	.....	.12	a
carnauba .....	.....	.23	a
Ozokerite, refined white .....	.....	.55	a
mountain .....	.....	.25	a
Paraffine, refined, 18-19 m. p. (cases) .....	.....	.0334	a
1-3 1/2 m. p. (cases) .....	.....	.04	a
1-5 1/2 m. p. (cases) .....	.....	.044	a
13-15 m. p. (cases) .....	.....	.06	a
crude, white, 117-119 m. p. (bbls.) .....	.....	.0312	a
yellow 14-16 m. p. (bbls.) .....	.....	.0312	a
Whiting, alba, factory .....	.....	6.50	a
commercial .....	.....	.45	a
gilders .....	.....	.55	a
Paris white, American .....	.....	.75	a
English chit-tone .....	.....	.90	a
Wood alcohol .....	.....	.47	a
Yellow ochre .....	.....	.028	a
Zinc oxide, American process (factory) horse head, .....	.....	.0312	a
"Special" .....	.....	.084	a
"XX special" .....	.....	.0734	a
French process, green seal .....	.....	.308	a
red seal .....	.....	.308	a
white seal .....	.....	.31	a
Zinc sulphide .....	.....	.064	a

EXPORTS OF CHEMICALS AND COMPOUNDING INGREDIENTS

From May 28 to July 18 inclusive, the following chemicals and compounding ingredients were exported from the Port of New York:

Destination.	Quantity.	Material.	Value.
Great Britain	1,655 packages	White lead	\$42,306
France	88 packages	White lead	2,629
Spain	20 barrels	White lead	578
Great Britain	6,055 barrels	Oxide of zinc	69,615
France	50,466 pounds	Toluol	28,958
Great Britain	215 barrels	Bone black	2,815
Russia	112,041 pounds	Carbonate of magnesia	6,655
Great Britain	134 drums	Acetone	18,255
Russia	45 barrels	Sulphur	228
Great Britain	300 barrels	Rosin	4,070
Italy	500 barrels	Rosin	4,956
Holland	3,670 barrels	Rosin	13,000
Holland	5,745 bags	Acetate of lime	26,155
Spain	1,537 bags	Acetate of lime	6,650
Denmark	720 bags	Acetate of lime	3,330
England	440,236 pounds	Acetic acid	23,726
France	15,857 pounds	Acetic acid	1,202
Norway	70 cases	Carbon black	813
Spain	23 barrels	Carbon black	171
Denmark		Carbon black	1,500
France	251,191 pounds	Benzol	22,343
England	280 barrels	Lithopone	4,480
England	55 barrels	Petrolatum	1,359
England	956,284 pounds	Paraffine wax	74,075
Switzerland	26,354 pounds	Paraffine wax	686
Sweden	12,831 pounds	Paraffine wax	612
Holland	1,196,842 pounds	Paraffine wax	6,227
Italy	2,124,628 pounds	Paraffine wax	70,511
Portugal	25,059 pounds	Paraffine wax	8,701
France	541,803 pounds	Paraffine wax	17,250
Denmark	7,068 pounds	Paraffine wax	333
Spain	1,430,584 pounds	Paraffine wax	92,956

The United States exported 34,017,166 pounds of zinc oxide, valued at \$1,631,853, during the eleven months ending May, 1915, against 26,096,954 pounds, valued at \$1,084,907, for the same period in 1914.

THE MARKET FOR COTTON AND OTHER FABRICS.

THE question of placing cotton on the contraband list is being vigorously agitated by the British press. The British government is urged to declare cotton absolute contraband and to purchase Southern cotton exchanges to the amount of cotton that would normally have gone to Germany and Austria-Hungary, and also to the amount of cotton exports to Holland, Denmark, Norway, Sweden and Switzerland. The State Department at Washington, however, intimates that American rights in the matter will be insisted upon under the principles of international law.

SEA ISLAND COTTON.

The month of July has been extremely quiet; though the uncertainty occasioned by the rumors of contraband cotton has had a disquieting effect on the market. Shipments from Savannah from June 5 to July 3 were 176 Bs. to Northern mills and 273 Bs.

to Southern mills. From Jacksonville 75 Bs. were shipped to Northern mills during the same period. The crops are reported to be in fine condition. The increase in acreage in Carolina, Georgia and Florida is variously reported at 15 per cent. to 30 per cent., and crop estimates range around 100,000 Bs. to 110,000 Bs. The latest Savannah quotations are as follows: Choice, 24 cents; Extra Choice, 25 cents; Fancy, 26 cents.

EGYPTIAN COTTON.

From Alexandria, Egypt, we have the following report: The first week in July passed with little interest being taken in the market, which reflects the general trade dullness. The spot market is inactive, although a limited demand for Uppers was noticed. There was little change recorded by the middle of the month and speculation is conspicuous by its absence. Some July sales were bought back by the trade, owing to a limited demand from America. Spot prices are unchanged, although considerable business has been done. The exports of the week ending June 20, 1915, were 3,700 Bs. against 9,500 Bs. a year ago. Crop reports are very satisfactory.

COTTON FABRICS.

July has been a very quiet month and the domestic fabric market would be called stagnant if it were not for the war orders. Mills that would be running on half time or shut down altogether are busy on goods for export. Ducks especially have been in good demand for foreign account. Domestic business has been strictly routine during the past month and prices of fabrics in general have not changed.

The export embargo on burlaps from Calcutta is being strictly enforced by Great Britain. This has resulted in lower prices on the Calcutta market, and the uncertainty of shipments has caused a practical stagnation in the New York trade. Trading was quiet and limited to small orders for emergency requirements.

For the eleven months ending May 31, 1915, there was 353,538,495 pounds of burlap, valued at \$25,031,432, imported into the United States, against 335,985,932 pounds, valued at \$28,447,882, for the same period in 1914.

The following are New York quotations on July 30, 1915:

Tire Fabrics:	
17½-ounce Sea Island, combed.....	\$.58 a \$.60
17½-ounce Egyptian, combed.....	.45 a .47
17½-ounce Egyptian, carded.....	.42 a .44
17½-ounce Peebles, carded.....	.35 a .37
Sheetings:	
40-inch 2.50-yd.....	.06 1/2
40-inch 2.70-yd.....	.06 1/2
40-inch 2.85-yd.....	.06 1/2
40-inch 3.15-yd.....	.06 1/2
Osnaburgs:	
40-inch 2.25-yd.....	.07 1/2
40-inch 2.48-yd.....	.07
37½-inch 2.42-yd.....	.07
Mechanical Ducks:	
Hose duck.....	.20 1/2
Belting Duck.....	.19 1/2
Carriage Cloth Duck:	
38-inch 2.00-yd. enameling duck.....	.10 1/2
38-inch 1.74-yd. enameling duck.....	.11 1/2
72-inch 6.66-yd. enameling duck.....	.25
72-inch 7.21-yd. enameling duck.....	.26
Drills:	
38-inch 2.00-yd. drill.....	.10 1/2
40-inch 2.47-yd. drill.....	.08 1/2
52-inch 1.90-yd. drill.....	.10 1/2
52-inch 1.95-yd. drill.....	.10 1/2
60-inch 1.52-yd. drill.....	.13 1/2
Yarns:	
Garden Hose 12 2-cabled.....	.16 a .18
Fire Hose 12 1.....	.16 a .18
Burlaps:	
32-7½-ounce burlap.....	100 yd. \$5.90
40-7½-ounce burlap.....	6.25
40-8-ounce burlap.....	6.35
40-10-ounce burlap.....	7.75
40-10½-ounce burlap.....	7.85
45-7½-ounce burlap.....	7.25
45-8-ounce burlap.....	7.35
48-10-ounce burlap.....	10.25

Exports of cotton duck from the port of New York, from May 28-July 18 inclusive, were as follows:

To Portugal, 41 packages, value \$2,278; Denmark, 191 packages, value \$6,166; France, 281 packages, value \$22,760; England, 70,002 packages, value \$208,506; and Glasgow, 7,760 packages, value \$229,072.

United Kingdom.

IMPORTS OF RUBBER

Tons	Six months ending June				
	1913	1914	1915	1914	1915
Dutch East India.....	11	115	747	193	322
French West Africa.....	65	11	58	198	141
Gold Coast.....	1	347	1,378	584	584
Other Colonies.....	12	13	197	466	584
Portugal.....	8	87	1,331	8,816	7,516
Rio de Janeiro.....	1	30	1,111	1,111	766
Straits Settlements.....	1,272	2,214	7,094	9,416	17,127
Federated Malay States.....	625	576	938	4,665	5,091
Ceylon and Dependencies.....	4	67	1,225	3,567	7,932
Other Countries.....	1,033	378	9,436	8,134	1,092
Total.....	4,764	4,441	6,338	36,487	35,581

EXPORTS OF RUBBER

Tons	Six months ending June				
	1913	1914	1915	1914	1915
Russia.....	517	1,697	3,538	3,756	6,238
Germany.....	941	1,098	5,620	5,609	...
Belgium.....	158	168	991	1,179	...
France.....	420	663	404	3,408	3,217
United States.....	1,354	1,947	3,098	7,964	13,034
Other Countries.....	346	358	737	1,930	2,079
Total.....	3,736	4,513	5,876	22,361	29,235

RUBBER STATISTICS FOR LONDON AND LIVERPOOL—JUNE, 1915.

L. n. l. o. n. —	Imports.	Deliv-eries.	Stocks.		
			1913.	1914.	1915.
Plantation.....	4,699	5,499	2,869	3,052	5,758
Other kinds.....	46	70	1,911	726	543
Total.....	4,745	5,569	3,880	3,778	6,301
Liverpool —					
			1913.	1914.	1915.
Para.....	974	833	1,336	819	1,323
Other kinds.....	586	448	1,326	1,096	624
Total.....	1,560	1,281	2,662	1,915	1,947
Total London and Liverpool.....	6,305	6,850	6,542	5,693	8,248

New York.

In regard to the financial situation, Albert B. Beers (broker in crude rubber and commercial paper, No. 68 William street, New York) advises as follows:

"The money market has remained so steady for the past few months that there are practically no changes to report regarding rubber paper in July from the conditions prevailing as previously reported, the best names being taken at 4 a 4½ per cent., and those not so well known 5 a 5½ per cent."

NEW YORK PRICES FOR JUNE (NEW RUBBER).

	1913	1914	1915
Upriver, tree.....	\$161 a .63	\$160 a .671	\$160 a .692
Upriver, coarse.....	45 a .47	40 a .44	54 a .62
Islands, fine.....	55 a .53	58 a .60	58 a .85
Islands, coarse.....	56 a .57	57 a .59	55 a .39
Cameta.....	53 a .53	53 a .53	56 a .43

STOCKS—JULY 1, 1915.

	For and Medium.	Coarse.	Cauch.	Total.
Arnold & Zeiss.....	75,000	20,000	95,000	
Henderson & Kott.....	10,000	10,000	20,000	
H. A. Aslett & Co.....	10,000	8,000	18,000	
Adams' Successors, Ltd.....	700	700	1,400	
Rubber Trading Co.....	10,000	10,000	20,000	
Hagmeier & Brunn.....	15,000	20,000	35,000	
A. D. Straus & Co.....	80,000	80,000	160,000	
L. Hagenaers & Co.....	80,000	80,000	160,000	
Muller, Schall & Co.....	135,000	20,000	155,000	
Rubber & Guayule Agency, Inc.....	15,000	7,000	22,000	
Charles T. Wilson Co, Inc.....	4,000	4,000	8,000	
Rumsey & Greutert Co, Inc.....	60,000	20,000	80,000	
Robert Badenhop.....	20,000	20,000	40,000	
W. R. Grace & Co.....	67,000	21,000	88,000	
Neuss, Hesslein & Co.....	91,000	8,000	99,000	
Mecke & Co.....	4,000	4,000	8,000	
Obalski & Sweeney.....	25,000	15,000	40,000	
Total.....	832,000	109,000	941,000	
Stock, Centrals.....	125,000		125,000	
Stock, Africans.....	50,000		50,000	
Arrivals, Plantations.....	14,143,600		14,143,600	
Arrivals, Guayule.....	551,500		551,500	

Review of the Crude Rubber Market.

NEW YORK.

July 30, 1915.

The month of July started off with very little inquiry from manufacturers, and while a few sales were reported buying activity was decidedly lacking. The market, however, was firm and prices reflected the strong position of plantation rubber in the London market. Prices remained about the same for all grades as the month progressed and the market continued quiet and steady. By the middle of the month a fair volume of business was reported in some quarters. Arrivals of plantation rubber were quite heavy during this period but the greater part was on contract, and prices remained firm. Little interest was shown in Para sorts. Other grades continued firm in price with fair trading according to the stocks that were arriving. During the last week of the month the cargoes due to arrive from London and the Far East had a depressing effect on the market, which was quiet but with prices firm. First latex spot was quoted at 63 cents, and Upriver line spot was quoted at 61@62 cents.

RUBBER AFLOAT.

The steamship "Merity," of the Companhia Commercio e Navegacao, with 50 tons of rubber from Para, is now due in New York. The steamship "Achilles," of the Ocean Steamship Co., Limited (Blue Funnel line), Booth & Co., of New York, agents, is afloat from Java with plantation rubber and is due to arrive early in August. There was 4,153 tons of plantation rubber received at the port of New York from London during June, and 1,596 tons from Singapore and Colombo. The shipments from Batavia, Java, were very small during that month and only amounted to 500 tons.

Crude rubber imports for the eleven months ending May 31, 1915, were 153,282,616 pounds, valued at \$73,324,551, against 122,567,042 pounds valued at \$66,321,789, for the same period in 1914.

LONDON.

Early in the month of July a firm market with good inquiry for both spot and future deliveries was noted, and prices were slightly in advance of those of the week before. On July 10, Standard crepe was selling at 2s. 7½d. for spot, Smoked sheet was 2s. 7d. and hard Para 2s. 7¼d. There was a good deal of interest shown in spot crepe, and considerable business was noted in this particular grade. Prices for future delivery have improved somewhat, although buying has been restricted. August delivery has been quoted at 2s. 5½d. to 2s. 7½d. September deliveries are quoted at from 2s. 5½d. to 2s. 6½d. Smoked sheets have not been in much demand and are held at about a half penny per pound less than spot crepe.

In the weekly report of Messrs. Sanderson & Co., the stocks in London on the 2nd of January are given as 6,877 tons, and on the 3rd of July as 6,366 tons, showing a decline of 511 tons in six months. The largest stock held during the last six months was on the 17th of April, namely, 7,922 tons; so that in the last six weeks stocks have been reduced 1,556 tons. The arrivals in London for 1915 to the 3rd of July total 35,616 tons, deliveries during the same period being 36,062 tons. From February to May, inclusive, the United States imported 34,000 tons. Crop estimates for 1915 are: 85,000 tons plantation; 38,000 tons Para; 10,000 tons from all other sources; total, 133,000 tons.

The price of plantation at the beginning of the war was 2s. 0½d. for crepe and 2s. 1d. for Smoked sheet. On January 1, it was 2s. 1d. for crepe and 2s. 3½d. for Smoked sheet, and on July 25 it was 2s. 7½d. for crepe and 2s. 6½d. for Smoked sheet. The price of Para at the beginning of the war was 2s. 10½d.

On the first of January it was 2s. 10½d., and on July 15 was 2s. 7½d.

SINGAPORE AND COLOMBO.

At the auction held in Singapore May 19, 182 tons was offered and 190 tons changed hands. On May 26, 210 tons was offered and 120 tons was sold. There was a large quantity offered at the auction held June 2, 220 tons being catalogued, but only 105 tons was sold. On June 9, 196 tons was offered and 130 tons was sold, at prices which generally marked a decided improvement. There was 255 tons catalogued on June 16 and 166 tons changed hands. The demand throughout the sale was good and all grades met with a ready sale at better prices.

At the Colombo weekly auction held May 28, 192 tons of rubber was offered and 166 tons was sold. On June 2, 135 tons was offered and 84 tons was sold. On June 24, there was 177 tons offered. The Ceylon Planters' Rubber Syndicate recently sold 12 tons of No 1 diamond smoked sheet, to be delivered in Colombo as follows: Two tons per month from July 1 to December 31, 1915, at 1s. 5½d. per pound.

The total export of Ceylon rubber from January 1, 1915, to June 21, was 8,357 tons, as compared to 6,848 tons in 1914 for the same period.

Cable advices state that the export of rubber from the Federated Malay States for the month of June last, amounted to 3,403 tons, as compared with 2,708 tons in May, making a total for the six months of 19,190 tons, as against 13,850 tons in the corresponding period of 1914.

The export of rubber from the various ports of the Straits Settlements for the month of June totaled 2,249 tons, as compared with 3,588 tons in May; bringing the total for the first six months of the year up to 15,609 tons, as against 8,506 tons in the similar period in 1914. These figures include transshipments of rubber from various places in the neighborhood of the Straits Settlements, such as Java, Sumatra, Borneo and the non-federated Malay States, as well as rubber actually exported from the colony. There was 55,700 pounds sold at the Penang auction held on June 8.

NEW YORK QUOTATIONS.

The following are the quotations at New York one year ago, one month ago, and July 30, the current date:

PARA.	Aug. 1, '14.	July 1, '15.	July 30, '15.
Upriver, fine, new...	72 @ 73½	62½ @ 63	60 @ 60½
Upriver, fine, old...	72 @ 75	63 @ 65	61 @ 63
Islands, fine, new...	57 @ 59	53½ @ 54	51½ @ 52
Islands, fine, old...	58 @ 62	55 @ 57	55 @ 56
Upriver, coarse, new	39½ @ 42	45½ @ 46	44 @
Islands, coarse, new	27 @ 29	28½ @ 29	28 @
Cameta	30½ @ 31½	31½ @ 32	31 @
Caucho, upper	38 @ 41	46 @ 46½	45½ @
Caucho, lower	35 @ 37	43 @ 44	43 @
PLANTATION HEVEA.			
Smoked sheet ribbed	56 @ 59	{ Spot @ 63	{ 62 @
		{ Afloat @ 62½	{ 61½ @
First latex crepe...			
	{ near-by @ 53	{ Spot @ 63	{ 63 @
	{ forward @ 52	{ Afloat @ 62½	{ 62½ @
Fine sheets and biscuits unsmoked...	54 @ 56	60 @ 61	60 @
CENTRALS.			
Corinto	39 @ 42	44 @ 45	43½ @
Esmeralda, sausage.	38 @ 41	44 @ 45	42½ @
Nicaragua, scrap...	35 @ 40	...	42 @
Mexican, scrap...	36 @ 41	44 @	42½ @
Mexican, slab...	25 @ 35	...	...
Manicoba, scrap .....	...	37 @ 38	37 @ 38
Mangabeira, sheet...	...	38 @ 39	38 @
Guayule	25 @ 35	32 @ 34	34 @ 35
Balata, sheet	45 @ 58	53 @ 56	55 @ 56
Balata, block	48 @ 53	45 @ 47	47 @ 48

IMPORTS FROM PARA AT NEW YORK

JUNE 25.—By the steamer *Sao Paulo* from Pará and Maranhão.

	Time	Me	pr	Case	Total
Meyer & Beyer	41,500	4	10		169,300
C. Amstutz & Co.	3,300	2	8		17,400
H. A. Astorff & Co.	1,000	3	0		24,500
Hagmeyer & Beyer	4,400		20		34,000
Henderson & Kohn	6,500	5			47,000
Arnold & Zeiss		50	13,400		44,000
A. D. Straus & Co.	11,000				17,000
Müller, Schulz & Co.	11,500				17,100
Gerard Rubber Co.	12,000	1			17,000
Neuss, Hoeslin & Co.	5,500				17,000
Total	170,300	1	27	87.8	324,300

JUNE 29.—By the steamer *Denis* from Pará and Manaus

Meyer & Brown	8,200	3,600	93,500	46,000	174,300
Arnold & Zoss	70,711	12,779	4,000	—	87,490
Hagemeyer & Bunn	53,600	—	3,000	—	56,600
G. Amsinck & Co.	17,600	—	—	4,000	21,600
Henderson & Kern	4,600	—	—	—	34,300
J. T. Johnstone & Co.	—	—	10,700	800	20,500
Robinson & Co.	1,000	—	1,000	—	3,400
H. A. Astlett & Co.	700	—	—	—	1,100
Rumsey & Greutert Co., Inc.	400	—	300	—	3,700
Total	166,400	16,379	108,500	44,000	383,000

JULY 12.—By the steamer *Aere* from Para and Maricao.

	1900	1901	1902	1903	1904	1905	1906	1907	1908	1909	1910	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	2101	2102	2103	2104	2105	2106	2107	2108	2109	2110	2111	2112	2113	2114	2115	2116	2117	2118	2119	2120	2121	2122	2123	2124	2125	2126	2127	2128	2129	2130	2131	2132	2133	2134	2135	2136	2137	2138	2139	2140	2141	2142	2143	2144	2145	2146	2147	2148	2149	2150	2151	2152	2153	2154	2155	2156	2157	2158	2159	2160	2161	2162	2163	2164	2165	2166	2167	2168	2169	2170	2171	2172	2173	2174	2175	2176	2177	2178	2179	2180	2181	2182	2183	2184	2185	2186	2187	2188	2189	2190	2191	2192	2193	2194	2195	2196	2197	2198	2199	2200	2201	2202	2203	2204	2205	2206	2207	2208	2209	2210	2211	2212	2213	2214	2215	2216	2217	2218	2219	2220	2221	2222	2223	2224	2225	2226	2227	2228	2229	2230	2231	2232	2233	2234	2235	2236	2237	2238	2239	2240	2241	2242	2243	2244	2245	2246	2247	2248	2249	2250	2251	2252	2253	2254	2255	2256	2257	2258	2259	2260	2261	2262	2263	2264	2265	2266	2267	2268	2269	2270	2271	2272	2273	2274	2275	2276	2277	2278	2279	2280	2281	2282	2283	2284	2285	2286	2287	2288	2289	2290	2291	2292	2293	2294	2295	2296	2297	2298	2299	2300	2301	2302	2303	2304	2305	2306	2307	2308	2309	2310	2311	2312	2313	2314	2315	2316	2317	2318	2319	2320	2321	2322	2323	2324	2325	2326	2327	2328	2329	2330	2331	2332	2333	2334	2335	2336	2337	2338	2339	2340	2341	2342	2343	2344	2345	2346	2347	2348	2349	2350	2351	2352	2
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JULY 16.—By the steamer *Boniface* from Pará and Manaus

GENERAL HYGIENE STEAMER COMPANY FROM DATA OF MANAGERS			
Meyer & Brown	68,500	17,000	81,500 = 200,500
Arnold & Zeiss	160,000	16,800	176,800
Henderson & Kern	4,900	28,000	32,900
H. C. Astlett & Co.	3,400	1,800	5,200
Rolapson & Co.	16,000	1,000	17,000
Amstutz & Co.	16,400	1,400	17,800
W. R. Grace & Co.	52,800	—	52,800
Abdel Smarrows, E. H.	—	500	500
Hagemeyer & Reinhold	—	—	31,600
L. L. Hubert & Co.	—	—	—
Total	300,000	68,500	368,500

JUNE 26 By the State of Puerto Rico

G. Rosenthal & Sons.....	3,000		G. Amsack & Co.....	7,000
G. Amsack & Co.....	1,000		Lawrence Leach & Co.....	1,000
Egberts & Humken.....	1,000	5,750	Sutter, Sutters & Co.....	1,000
JUNE 16. By the City of Chicago.....	7,000		J. S. Semblat & Co.....	1,000
International Banking Corp.....	7,000		Hermann Wolff & Co.....	1,000
Mecke & Co.....	2,500	10,750	Polk, Clark & Co.....	1,000
JUNE 19. By the City of Portland.....	1,000		A. M. Campbell & Co.....	1,000
I. H. Rosbach Bros.....	1,000	28,000	Gernard & Co.....	1,000
JUNE 29. By the City of Portland.....	1,000		Conrad, Kelley & A. S. Co.....	1,000
John Brandt & Bros.....	1,000		M. A. DeLoe.....	1,000
A. Held.....	1,000		Peter Norbeck & Co.....	1,000
G. Amsack & Co.....	4,000	70,000	Mecke & Co.....	1,000
JUNE 30. By the City of Chicago.....	7,000		Waters.....	30,100
G. Amsack & Co.....	7,000		City of Portland.....	1,000
Commercial Bank of Spain.....	1,000		City of Portland.....	1,000
American.....	1,000		City of Portland.....	1,000
Danarrest Bros.....	1,000		City of Portland.....	1,000
Dreisco, Duke & Co.....	1,000	9,800	City of Portland.....	1,000
JULY 1. By the City of New Orleans.....	1,000		City of Portland.....	1,000
A. N. Riddle.....	1,000		City of Portland.....	1,000
JULY 1. By the City of Chicago.....	7,000		City of Portland.....	1,000
Mecke & Co.....	2,500		City of Portland.....	1,000
G. Amsack & Co.....	2,500	5,000	City of Portland.....	1,000
			City of Portland.....	1,000

[AUGUST 1, 1915.]

[illegible]

Period	Para	Manaos	Iquitos	Total
Rubber exports	62,888	54,942	8,214	126,044
Rubber imports	1,077	847	1,077	3,001
Rubber stock	1,077	847	1,077	3,001
Rubber stock	1,077	847	1,077	3,001

RUBBER RECEIPTS AT MANAOS FROM JULY, 1914, TO JUNE, 1915.

Period	Para	Manaos	Iquitos	Total
July	6,726	4,074	552	11,352
August	34	176	773	1,183
September	14,000	185	986	16,171
October	1,000	185	986	3,171
November	1,000	185	986	3,171
December	1,000	185	986	3,171
Total	2,977	984	3,293	9,498
1915	231	16	884	1,131
January	354	307	11	2,110
February	28	416	1	764
March	1,7	317	215	133
April	154	1	375	108
May	1	117	512	186
Total	1,434	641	1,167	3,242
Grand total	2,977	984	3,293	9,498

EXPORTS OF INDIA RUBBER FROM MANAOS DURING JUNE, 1915.

EXPORTERS	Fine	Medium	Coarse	Cauchó	Total	Fine	Medium	Coarse	Cauchó	Total	Grand Total
Suter & Co., Ltd., London	44,074	6,726	22,909	77,881	151,590	34,437	1,159	146	12,600	48,342	199,932
General Rubber Co., Ltd., Brazil	23,069	8,747	24,067	49,888	110,911	60,837	24,469	1,180	44,197	130,683	241,594
Adolph H. A. Ltd., London	1,755	1,091	507	11,158	14,511	31,469	10,742	14,561	64,025	121,098	135,609
Prado & Co., Ltd., London	28,658	1,000	17,617	8,167	56,175	59,487	4,740	523	13,559	68,979	125,154
Tancredi Porto & Co., Ltd., London	344	40	3,514	7,792	11,690	28,884	17,800	6,701	14,038	67,123	78,813
G. Fralho & Co., Ltd., London	1,000	1,000	1,000	1,000	4,000	8,609	6,080	129	1,000	14,818	30,195
Stowell & Co., Ltd., London	12,421	1,000	1,000	1,000	15,421	10,153	1,893	1,042	6,433	19,613	19,613
Zarges, Ohliger & Co., Ltd., London	12,421	1,000	1,000	1,000	15,421	10,153	1,893	1,042	6,433	19,613	19,613
Theodore Lang, Ltd., London	1,000	1,000	1,000	1,000	4,000	4,781	37	5,191	3,829	9,769	12,794
B. Levy & Co., Ltd., London	1,000	1,000	1,000	1,000	4,000	4,781	37	5,191	3,829	9,769	12,794
G. Dettmer & Co., Ltd., London	1,000	1,000	1,000	1,000	4,000	4,781	37	5,191	3,829	9,769	12,794
Semper & Co., Ltd., London	1,000	1,000	1,000	1,000	4,000	4,781	37	5,191	3,829	9,769	12,794
L. G. Arroyo & Co., Ltd., London	1,000	1,000	1,000	1,000	4,000	4,781	37	5,191	3,829	9,769	12,794
Mesquita & Co., Ltd., London	1,000	1,000	1,000	1,000	4,000	4,781	37	5,191	3,829	9,769	12,794
Soc. An. Armazens de Resina	1,000	1,000	1,000	1,000	4,000	4,781	37	5,191	3,829	9,769	12,794
Total	120,347	18,337	86,694	159,600	384,978	230,405	67,210	35,284	158,880	491,779	876,757
To Rio de Janeiro	1,000	1,000	1,000	1,000	4,000	4,781	37	5,191	3,829	9,769	12,794
To Rio de Janeiro	1,000	1,000	1,000	1,000	4,000	4,781	37	5,191	3,829	9,769	12,794
Total	120,347	18,337	86,694	159,600	384,978	230,405	67,210	35,284	158,880	491,779	876,757

EXPORTS OF INDIA RUBBER FROM MANAOS FROM JANUARY TO JUNE, 1915.

EXPORTERS	Fine	Medium	Coarse	Cauchó	Total	Fine	Medium	Coarse	Cauchó	Total	Grand Total
General Rubber Co., Ltd., Brazil	436,914	102,205	250,556	190,945	980,620	546,698	142,662	34,075	223,047	946,482	1,927,102
Prado & Co., Ltd., London	28,346	1,000	144,998	144,998	339,634	33,600	60,445	48,944	70,048	213,017	1,451,651
Suter & Co., Ltd., London	310,431	31,503	187,544	284,673	814,151	360,040	27,995	9,844	174,883	572,762	1,386,913
G. Fralho & Co., Ltd., London	148,756	13,600	1,553	39,415	203,324	371,044	93,482	32,103	57,130	553,759	1,250,781
Adolph H. A. Ltd., London	11,742	12,691	17,912	11,823	54,168	316,372	62,665	100,794	201,938	681,769	735,937
Tancredi Porto & Co., Ltd., London	43,089	20,351	29,615	9,118	102,173	186,918	48,240	44,754	72,737	352,649	454,822
L. G. Arroyo & Co., Ltd., London	1,000	1,000	1,000	1,000	4,000	4,781	37	5,191	3,829	9,769	12,794
B. Levy & Co., Ltd., London	1,000	1,000	1,000	1,000	4,000	4,781	37	5,191	3,829	9,769	12,794
Sundry shippers	101,883	8,321	21,249	47,248	178,701	114,151	14,126	26,996	42,729	198,002	376,703
Total	1,590,832	224,698	926,710	831,335	3,573,575	2,455,299	469,054	309,702	853,277	4,087,332	7,660,907
Imports	143,227	15,776	80,371	512,613	751,987	224,021	15,113	54,100	250,655	543,889	1,295,876
Grand total	1,734,059	240,474	1,007,081	1,343,948	4,325,562	2,679,320	484,167	363,802	1,103,932	4,631,221	8,956,783

EXPORTS OF INDIA RUBBER AND CAOUTCHOUC FROM PARA, MANAOS AND IQUITOS DURING THE MONTH OF MAY, 1915.

EXPORTERS	Fine	Medium	Coarse	Cauchó	Total	Fine	Medium	Coarse	Cauchó	Total	Grand Total
Zarges, Ohliger & Co., Ltd., London	13,262	1,000	489	10,446	24,197	67,373	1,270	1,000	61,119	70,652	131,142
Adolph H. A. Ltd., London	27,345	6,658	43,927	6,330	84,260	53,348	9,904	3,033	21,006	84,291	168,551
General Rubber Co., Ltd., Brazil	47,899	6,650	43,927	6,330	104,806	53,348	9,904	3,033	21,006	84,291	168,551
J. Marquis & Co., Ltd., London	9,744	389	1,357	944	12,434	14,883	1,460	1,460	45,632	63,435	75,869
Suarez, H. & Co., Ltd., London	9,744	389	1,357	944	12,434	14,883	1,460	1,460	45,632	63,435	75,869
Pires, Teixeira & Co., Ltd., London	13,090	1,100	26,800	18	41,008	14,117	1,460	1,460	45,632	63,435	75,869
Suter & Co., Ltd., London	13,090	1,100	26,800	18	41,008	14,117	1,460	1,460	45,632	63,435	75,869
St. An. Armazens de Resina	6,482	964	11,913	1,760	20,119	14,245	1,807	4,341	18,044	38,437	58,581
Suarez, H. & Co., Ltd., London	6,482	964	11,913	1,760	20,119	14,245	1,807	4,341	18,044	38,437	58,581
Manaos	362,523	18,561	171,726	166,107	678,917	370,650	3,436	43,096	53,081	607,263	1,286,180
Iquitos	83,597	23,174	171,018	158,648	436,437	278,227	50,678	21,333	173,638	543,889	1,295,876
Total	917,990	32,709	373,481	327,665	1,651,845	1,023,961	75,971	72,941	248,354	1,376,227	2,928,072



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IMPROVED HOSE REEL

A new hose reel is constructed so that by moving the reel truck on the ground a friction transmission causes the reel to wind or unwind the hose. A simple clutch arrangement neutralizes the friction gearing at will. [German Empire Registered Sample No. 477.]

THE RUBBER SCRAP MARKET.

THE Russian embargo on the exportation of rubber scrap has closed for the time being the source of large supplies that were imported to the United States previous to the war. However, it is announced that arrangements are being made by the Department of Commerce of the United States and the Russian foreign office, by which goods will be exported from Russia under a guarantee that they will not be re-exported. If this arrangement is consummated, it will release considerable rubber scrap that is now withheld from the American market. The imports of rubber scrap into the United States from Russia during the year 1912-1913 were 7,468,274 pounds, valued at \$619,594. In the year 1913-1914 there was imported 5,018,555 pounds, valued at \$453,522. The Italian government has now placed waste and reclaimed rubber on the list of goods considered absolute contraband.

During the month of July there was very little business being done in a public way, but the firm tone of the market and steady prices seemed to indicate that considerable business was being transacted quietly. As a rule, the mills are quite busy in July, and as the manufacturers have been working overtime on war orders, the indications are that the waste trade will soon feel the effects of this general trade movement.

Early in the month, boots and shoes were held at 75¢c. delivered to the mills, although some business was reported at a shade less. The price of Goodrich and Goodyear auto tires was firm at 65¢c. delivered; and No. 1 inner tubes continued strong at 25½¢@26¢. As the month progressed there was very little trading, and it is evident that large quantities of scrap have been quietly absorbed by the mills from various sources, which is now being used.

During the last week of the month the purchasing trade appeared reluctant to enter the market with large orders, but the impression exists that next month will record better business.

The rubber scrap imports for eleven months ending May, 1915, were: 9,833,120 pounds, valued at \$652,019, against 23,361,452 pounds, valued at \$1,889,125, for the same period in 1914. Exports for the same period in 1915 were 2,056,564 pounds, valued at \$241,781, against 5,610,213 pounds, valued at \$532,945, for 1914.

Rubber scrap imports received at the port of New York during July were as follows: July 6, by the "Havana," from Havana, 50 packages; July 8, by the "Athinai," from Piraeus, 1 barrel; July 9, by the "Tropea," from London, 35 barrels; July 13, by the "Parima," from St. Croix, 1 box; July 13, by the "Saratoga," from Havana, 29 packages; July 13, by the "Kentigern," from London, 25 barrels.

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New York, July 30, 1915.

	Per Pound.
Boots and shoes	7¼ a
White Goodrich and Goodyear tires	7 a
Morgan & Wright and U. S. tires	6¼ a 6½
Trimmed arctics	6 a 6¼
Auto tires, mixed	5 a 5½
Sohl tires	4½ a
No. 1 inner tubes	25 a 26
No. 2 inner tubes	11½ a
Red tubes	10¼ a
Bicycle tires	3 a 3½
Irony tires	1¼ a 2¼
No. 1 auto peelings	8 a 8½
Mixed auto peelings	6¾ a 7
No. 1 soft white rubber	11 a 12
White wringer rubber	9¼ a 9½
No. 1 red scrap	10 a 10½
Mixed red scrap	7¼ a 7½
Mixed black scrap	2½ a 2¾
Rubber car springs	3¼ a
Horse shoe pads	3 a 3¼
Matting and packing	1½ a 3¼
Garden hose	1¼ a 7½
Air brake hose	5 a
Cotton tire hose	1¼ a 2

Rubber, iron, copper, etc. No. 2,509—Sealed proposals will be received at the office of the Lighthouse Inspector, U. S. M. C. A. Building, Portland, Me., until August 16, 1915, for purchase of old materials, such as bell metal, rubber, iron, copper, yellow metal, rope, boats, etc. Blank proposals and particulars may be had by addressing above office.

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PAGE 73

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Vol. LII. No. 6.

SEPTEMBER 1, 1915.

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Published on the 1st of each Month by

THE INDIA RUBBER PUBLISHING CO.

No. 25 West 45th Street, New York.

CABLE ADDRESS: IRWORLD, NEW YORK.

HENRY C. PEARSON, Editor

Vol. 52.

SEPTEMBER 1, 1915.

No. 6

SUBSCRIPTIONS: \$3.00 per year, \$1.75 for six months, postpaid, for the United States and dependencies and Mexico. To the Dominion of Canada and all other countries, \$3.50 (or equivalent funds) per year, postpaid.

ADVERTISING: Rates will be made known on application.

REMITTANCES: Should always be made by bank draft or Postoffice or Express money order on New York, payable to THE INDIA RUBBER PUBLISHING COMPANY. Remittances for foreign subscriptions should be sent by International Postal Order, payable as above.

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Entered at the New York postoffice as mail matter of the second class.

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WAR-BOOMED BUSINESS WHEN THE WAR IS OVER.

MR. COREY, formerly president of the steel corporation, is reported to have stated on his return recently from Europe, that the war had three more years to run. Mr. Corey is a man of standing and is entitled to his guess—for at the present juncture it is a guessing contest pure and simple. It does not seem at all probable that peace will be deferred another three years. It might be; and again it may come in a few months. The only fact that can be predicated with certainty is that peace will come—soon or late. And when it comes, what will happen commercially? What will befall the manufacturers in this country who now have the trade that the belligerents used to have and which we were unable in times of peace to wrest from them? Can we keep it, or will Europe forthwith retrieve it?

When the European artisans lay down their arms and go back to their work, can they produce on the same old basis of costs? Their general efficiency must of necessity be materially lowered. Hundreds of thousands of skilled workmen will lie buried in the trenches. Other hundreds of thousands will return to work maimed in body and dulled in mind. Factory organization will be

sadly awry, and the whole machinery of production will be quite out of smooth running. Moreover, taxes will be increased and the cost of living inevitably raised. Will not all this mean an increase in manufacturing costs?

Normally it would, but the situation will not be normal; it will be far from it. Europe will have to regain, if not all, at least a substantial part of her lost trade. It will be a case of grim necessity; and when necessity enters into a situation minor factors fade away. England, Germany and France will undoubtedly fight for their old places in the export world, even if the employer has to abandon for the time being all expectation of profit and the employee reduce his comforts to the minimum.

American manufacturers who argue that having secured some of Europe's former trade they will be able to hold it permanently, war or peace, will be likely to discover that they have deceived themselves. There is the dyestuff trade, for instance. The Department of Commerce at Washington is making notable efforts to assist the manufacture of aniline dyes in this country and to protect it against German competition when the war may end, but experienced chemists believe that this industry will be one of the first that the Germans will endeavor to regain, and that it will be difficult to hold it permanently against their competition. The industry has been marvelously organized in that country, and they will have one substantial advantage at the close of the war, namely, an accumulation of coal tar by-products left from the manufacture of explosives which can be used in the making of aniline dyes.

But to confine the discussion solely to the export trade in manufactured rubber goods: In 1913, the last year of normal European trade, the exports of manufactured rubber goods from the United States amounted in value to \$12,054,455. During the same twelve months the value of exports of manufactured rubber goods (including insulated cables) from Great Britain amounted to \$34,799,790; from Germany, to \$32,000,000; from France, \$18,331,333; from Russia, \$2,784,000—the total exports of manufactured rubber goods from these four belligerent countries amounting in that year to nearly \$88,000,000, or over seven times our own.

At present of course no belligerent country is able to maintain this export trade. England has lost over half of hers, France has but little and Germany practically none at all. Naturally, American manufacturers are getting a certain portion of this trade. The question is, how much will they keep after the treaty of peace is signed? Of one thing they can feel quite confident, that they will not be left in quiet and undisturbed possession of their newly acquired customers, for the rubber manufacturers of England and the Continent may be depended upon to make for their old preserves with despatch and determination.

The moral of all of which is that American rubber manufacturers should lay hold of all the extra trade that the war has deflected in their direction, but keep con-

stately in mind that if they make extensive investments in increased equipment with the expectation of keeping the new business permanently, they must be prepared later to defend it against attack from overseas.

A GIFT THAT IS WORTH A SECOND THOUGHT.

IT is fairly easy to be generous with your savings when you're dead; there is not much temptation to hold back something for yourself in your will. But when a man in fine health, with a reasonable expectation of forty years more of life's varying fortunes, divides up with mankind and gives his fellows a large slice of his accumulations, that's another story. That is unusual. That is unique.

But that is just what Mr. Litchfield, factory manager of The Goodyear Tire & Rubber Co., has done. He has been manager of the Goodyear factory for fifteen years, and by way of celebrating this event, and to show their appreciation of him, his fellow workmen recently gave him a dinner. And he, to show his appreciation of his fellow workmen, presented them with a check for \$100,000, as a general welfare fund. Not so bad for a young man of forty! It speaks well for his success as a factory manager and still better for the clearness of his vision as to what life's all about.

SOME INTERESTING CURRENT RUBBER STATISTICS.

SOME recent rubber statistics are rather more than usually interesting. War is invariably a disturbing factor, and undoubtedly the complaints that have come from the rubber planters in the Far East regarding the interference with their shipping facilities are well grounded; and it is also undoubtedly true that the plantation forces have been much disorganized by reason of the absence of many of their young men in service on the Continent. But notwithstanding all these drawbacks the plantations seem to be getting along very comfortably. The imports of plantation rubber at London during the first six months of the present year amounted to 32,166 tons, as compared with 18,074 tons for the corresponding period last year. If the increase of plantation shipments is so rapid under the many present difficulties, what will it be when the times are again normal?

There is another item among recent statistics that is also interesting, namely, a comparison of the current imports of rubber into the United States from London with those of last year. For the first six months of the present year they amounted to 21,757 tons, as compared

with 13,034 tons for the corresponding period a year ago; a gain of over 66 per cent. As the imports of Brazilian rubber into London during the six months ending with last June only amounted to 7,506 tons, it is very evident that the great percentage of our imports this year from London consists of plantation rubber; which cannot fail to suggest what a predicament we would have been in if the embargo had been continued.

BEING INDEPENDENT WHEN YOU'RE NOT.

IT has been hinted that American rubber manufacturers really did not need to make an agreement with England as to exports in order to get crude rubber supplies, the argument being that England wants money in the bank very much more than surplus rubber in the warehouse. That is what the Swedes thought, evidently, for they refused an absolute embargo on rubber exports in directions accessible to the enemies of the Allies. As a result Sweden is reported to be in the throes of a rubber famine, which is likely to grow more acute rather than less.

An independent spirit is admirable, but the assumption of independence in a position of dependence has its drawbacks.

WILL BRAZIL VALORIZE AGAIN?

LATE advices from Brazil state that the federal government is definitely contemplating another plan for the valorization of rubber and coffee. The measure has already passed the Chamber of Deputies and is said to have such strong influence back of it that it will undoubtedly pass the Senate in the immediate future. The new president of the republic is believed to have favored the project ever since he came into office. This proposal for valorizing Brazil's chief products is, briefly, as follows: The government will authorize a new issue of 350,000 contos (\$90,000,000), a small part of which will be used for taking care of pressing debts while the rest will be employed in financing the coffee and rubber crops. It is the government's hope that this new legislation will, measurably at least, relieve the embarrassment, caused by the war, in Brazilian financial and commercial circles.

Limiting the consideration of this project to its relation to rubber, the plan briefly is that the government shall deposit this new issue of currency with the Bank of Brazil, and the bank shall be authorized to advance 80 per cent. of the value of rubber to producers who place their stock in a warehouse and present the receipt to the bank.

Valorization has been tried a number of times in Brazil, and has never yet proved a success. The last

attempt to valorize rubber was made in 1909, and proved an expensive venture to the Bank of Brazil; but this later plan differs somewhat from any of its predecessors, as apparently it does not contemplate the withholding from the market for any length of time of any large quantity of rubber. Under the present plan the owner of a quantity of rubber who may be pressed for ready money is not compelled to sell his rubber to the first bidder—usually an intermediary—at whatever price he may be offered. By putting his rubber in the warehouse and securing an advance of 80 per cent. he is afforded time to look for the most advantageous market.

If this government assistance is used only in this way, to enable the owner of the rubber to look about for the highest bidder or to hold his rubber during a few days of exceptionally low prices, until the market reaches its normal level again, it will be an advantage undoubtedly to the producing industry. But if any general attempt is made to hold back Brazilian rubber in large quantities with the expectation of affecting the market generally, the plan will undoubtedly prove quite as ineffective as in the past. If Brazil's valorization venture proved a failure in 1909 when the Amazon production was 42,000 tons as against a plantation output of 3,600 tons, what sort of a corner would Brazil be able to effect in 1915 with an Amazon production not exceeding 30,000 tons, as against a plantation total of 85,000 tons.

FORTY MILLIONS FOR POSSIBLE PUNCTURES.

IT is estimated that there are 1,623,555 pleasure cars equipped with pneumatic tires now in use in the United States. But as it is always wise to be conservative when venturing into statistics we will call the number an even 1,600,000. Assuming that the average cost of properly tiring a car is \$25 a wheel, or \$100 for the car, we have an aggregate cost of tire equipment for pleasure cars of \$160,000,000. That is a fairly large item, but it cannot reasonably be begrudged, as the tires which are in actual use on the four wheels are an essential part of the car, without which the pleasure motor vehicle would be a jolting impossibility.

But what this paragraph is particularly concerned with is that fifth tire which is not in use, but which is necessitated by the always impending puncture. Those 1,600,000 extra tires strapped to the side or to the back of the car as a sort of insurance policy against possible nails or broken glass, cost the car owners forty millions a year. To be sure, that is not all insurance money, because that fifth tire may in time take the place of one which has done its legitimate service and run its allotted number of miles. But generally speaking, the fifth tire performs its expected function of replacing a punctured predecessor, from which it follows that the greater part of the forty million dollars now represented by tires that

do not carry but have rather to be carried, is insurance money, pure and simple. Rather a burdensome extra. When will the genuine puncture-proof tire appear which will enable the car owner to start out with only four tires, with the unfailing assurance that the same four will bring him back?

HARD TIMES AND THE CHEWING OF GUM.

THAT species of rubber botanically called *Achras sapota*, but more familiarly known as chicle, may not be a highly important member of the rubber family, but certainly it is one of the most popular members, and its activities must always be followed with interest. It appears that the year ending with last December—twelve months of distinct depression in American industries generally—was one of unusual prosperity for purveyors of chewing gum, if we may judge from the increased profits of the manufacturers of this staple.

Now this question naturally arises: In a year when, owing to changes in tariff and banking systems and to the outbreak of an unprecedented war, the social and commercial world was in a state of pronounced dejection, why should the chewing of gum show a marked increase? Does maxillary activity tend to relieve mental disturbance, lull the restless spirit and banish care? Or is this a matter of pure economics? Do men when times are hard chew gum to save the cost of a fifteen-cent cigar, and do women resort to chiclets as a sort of saving substitute for the seductive *sindae*? Here is a new field for the psychologists. Where is Professor Münsterberg with his infallible charts?

THE EFFECTS OF THE WAR ON THE COMMERCIAL INTERESTS AND FINANCES of the United States have been discussed from every angle, but there is one effect of minor importance but still interesting which has attracted little if any attention, and that is the marked decrease in immigration since the beginning of hostilities. During the year ending with June, 1914, 1,218,480 new citizens came to our shores. During the year ending with last June—which included eleven months of the war period, the number of immigrants was only 326,700, or but a little over a quarter of the number for the preceding year. The arrivals last June were 22,598 as compared with 71,278 for the same month the year before.

This marked falling off of immigration is not altogether to be regretted. This country is an asylum for the oppressed of all the earth, of course, and in the development of its resources there is still a vast deal of manual labor to be performed which native Americans seem disposed to delegate to new-comers; but for the permanent good of the country, immigration shall proceed only as rapidly as it can be properly Americanized. Digested aliens build up the body politic; undigested aliens are liable to give the body politic some sharp stomachic pains.

The Story of Gutta Percha—II.

PHYSICAL PROPERTIES

JUST as gutta percha is so generally confused with rubber is not apparent to those who know both gums. They are quite different, to be sure, the products of the coagulated milk of tropical trees. Gutta percha in its manufactured state may resemble hard rubber, but only in appearance. To the expert, rubber is not as much like gutta percha as gold is like platinum. The fact that there are scores of resinous bastard guttas and bastard rubbers of course adds to the popular confusion.

From the beginning the Malay, wild and partly civilized, has been the world's gutta percha gatherer. He elected in the first place to cut down the tree and lop it of branches "to prevent the milk from flowing into the leaves," catching the latex in bamboo tubes, coconut shells, folded leaves, or in holes in the ground. His axe is the parang, the oriental equivalent of the machete.

The latex, yellow white, reddish, or even with a brown tinge, flows slowly and at best gives only two or three pounds of gutta from a medium tree. The gatherer, if he gets only a little, rubs the milk in his hands and as it thickens forces it into a hole in a block of wood. The latex in the vessels is boiled with lime juice or cocoanut oil until it coagulates. Just as rubber milk on the Amazon is injured by rain water, so is gutta percha milk, but by reboiling the stringiness disappears.

The gatherer may add certain clays, sago flour or any cheap adulterant that is in sight, but that is to be expected.

This crude gutta the Gutta Muntah—comes from the native gatherers in many shapes and of many qualities. As there are many varieties of gutta producing trees, there are mixtures that produce numberless varieties in the lots that come into the hands of the Chinese traders, who sort, value and mix for the market.

The Malays well know the best trees to tap and are able to give the Gutta Taban Merah unadulterated if they so desire; that is, if the Palaquium gutta is plentiful. If, however, there are only a few or that best of all gutta trees, they are apt to mix with it the Minjato, the Simpor, the Putih, or even the Susu. In the long run this is not profitable, for the traders are very alert and pay less for poor lots, but the gatherer does not care. The best grade as it comes from the forest varies in color from light brown to a dirty white. There are always bits of bark in it. Hardness and tenacity are its chief characteristics. Softened in hot water it becomes plastic, but not sticky. When cooled it regains its hardness completely. Invariably such lots have a definite earthy smell. Such would be the products of the Palaquium gutta. Lots taken wholly or in part from other Palaquium would vary in color, being sometimes almost black, or this is rather green within, some quite plastic, some hard, some friable, some waxy, and some wet and sticky.

For years the collection of gutta was in the hands of wild Malays who never saw a white man and rarely saw the Chinese traders to whom they bartered their goods. Their method of trading, so it is said, was unique and simple. At certain seasons the gatherer journeyed to the nearest river and deposited his gutta on the bank. The sign of his particular family—a cow, monkey or tiger—molded from gutta, topped the pile. The owner then secreted himself in the jungle and waited. In time along came a Chinese trading boat, which stopped, valued the gum and took it away, leaving in exchange cloth, ornaments, knives, or whatever passed current as valuable from the jungle standpoint. This sort of trading lasted for years, and neither the bloodthirsty savage nor the wily Chinese attempted to get

the best of the bargaining. Many such tokens are to be found in the hands of curio collectors today, and as they are always made of the best gutta, they give a better idea of the gum than do the ordinary forest samples.

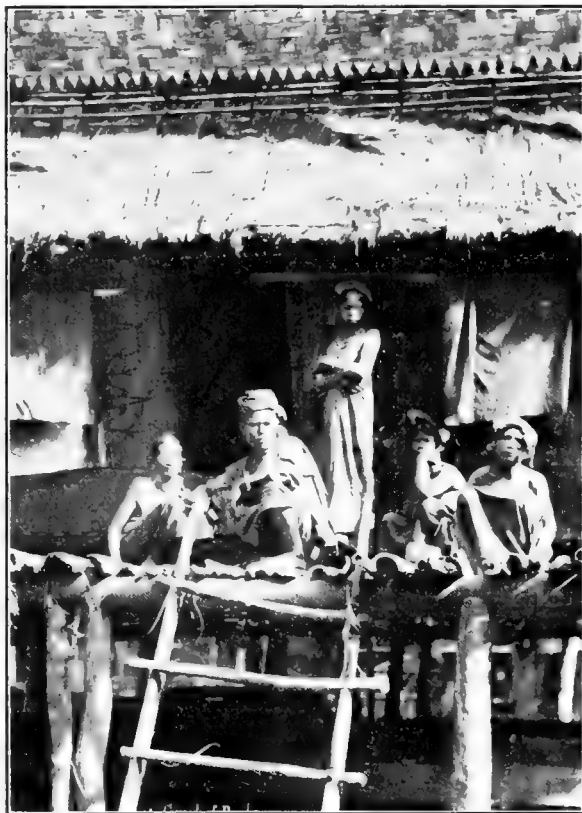
Gutta percha as it comes to the American or European manufacturer is a composition prepared in the Chinese grading and mixing factories in Singapore. It is the result of the mixing of a variety of lots—good, bad and indifferent—so that certain grades are obtained. This is done by shredding the various lots, boiling them soft and massing them on rolls similar to mangle rolls. So generally is this practiced that unmixed lots are not to be found on the market. This gutta looks and feels like blocks of corky wood. It is this that appears in the laboratory for examination, as well as in the factory for manufacture.

Speaking of the gutta mixers, the writer visited a Singapore "Godown," where mixing and grading was done on a large scale. The Chinese owners made no objection to a careful examination of the various lots of good and bad that were selected for mixing, but

when it came to taking photographs they blandly objected, promising to do it themselves later and forward prints—which of course was never done.

Pure gutta percha of the highest grade is colorless and almost transparent in thin cuttings, but shows pinkish in cut sheets about 1/5 millimeter thick, against a white surface. It has no taste and almost no odor, except on decomposition. At ordinary temperatures it has an appearance similar to that of wood—smooth, extremely tough and only slightly elastic. It may show a tensile strength of 525 pounds per square millimeter when stretched 50 to 60 per cent. It is pliable, may be folded, twisted, tied or stretched, and may easily be cut with a sharp blade or pointed tool. Its elasticity is low.

In structure it is cellular but impermeable to water, which it absorbs only in the surface cells. The material becomes fibrous when pulled out and at 100 per cent. elongation it will support, without breaking, double the force that was required to stretch it. Unlike rubber, it is easily torn by a transverse force. The



GUTTA GATHERER'S HOUSEHOLD.



COAGULATING GUTTA LATEX.

susceptibility of passing from the cellular to the fibrous condition varies in the different kinds of guttas. The more markedly

this quality is developed the greater the separation from the low grade guttas known as gutta caoutchouc. Excess of the fibrous structure renders gutta percha too brittle and unsuited to cable making. In its normal condition the specific gravity of gutta percha is 0.979 to 0.999. Compressed specimens show 1.010 to 1.020. Gutta percha is preserved by immersion in cold water. By the action of light and air it rapidly oxidizes to a hard, brittle resin, completely losing its toughness and emitting an acid odor. This change is more rapid in air at 77 to 86 degrees Fahrenheit, if the material is exposed in thin sheets

and frequently moistened and dried in the sun. When thus converted into a resin it increases in weight and in solubility in alcohol and alkalis and becomes a good conductor of electricity. All the gutta perchas of commerce contain these oxidation products up to 15 per cent., which are insoluble in water and benzene.

In this connection it should be stated that oxidation under the influences of air and light only proceeds slowly when the gum has been well compacted by thorough mastication. This oxidation does not proceed in a constant manner. Some samples will resist all deterioration, while under the same conditions others will crumble on handling. The explanation is offered, in such case, that the commercial gums used are of diverse composition, largely because not standardized by the collectors or traders.

Freshly cut surfaces of gutta percha are not tacky and will not unite with each other at ordinary temperatures, but if gently heated and pressed in contact strongly they will adhere permanently.

A low temperature, several degrees below zero Fahrenheit, has no effect on gutta percha. The increase of its pliability by heating is noticeable between 85 and 100 degrees Fahrenheit, and at 122 degrees Fahrenheit it yields readily to slight pressure and is capable of receiving and retaining the most delicate impressions. At 194 degrees Fahrenheit it becomes adhesive and pasty, permitting the mass to be freely molded into any desired



KNEADING AND PRESSING GUTTA CAKES

shape, which it retains at normal temperatures. This characteristic property is due to the air interposed in the pores of the material. At 212 degrees Fahrenheit pasty fusion terminates and the substance resumes in the air, absorbing 25 per cent of its volume of oxygen. Melting occurs at 266 degrees Fahrenheit with decomposition and the material remains permanently viscous. Application of higher heat causes boiling and distillation with a carbonaceous residue. The distillates consist of isoprene and caoutchouc as well as oil.

The application of a flame to gutta percha causes it to ignite quickly and burn with a shower of sparks and the dropping of the melted material, after the manner of burning sealing wax.

The impermeability of gutta percha is an extremely important characteristic. Water, either fresh or salt, penetrates to only a very limited depth into its pores. Such mechanically included water in no way changes the dielectric properties of the material if it does not exceed two to three per cent by weight of the gum.

It is a poor conductor of heat and electricity, being the most valuable dielectric plastic known. Gently rubbed with silk, gutta percha will emit electric sparks practically an inch in length. Faraday, in 1843, discovered the insulating property of gutta

percha and preserved its application. Under water and in the ground it retains, practically permanently, its value as an insulator. According to Wunsche and others, under standard conditions of temperature (75.2 degrees Fahrenheit) and dimensions, the insulating power of gutta percha, referred to copper as unit, is expressed by the number 10.

Gutta percha resists most solvents and is completely insoluble in water at all temperatures. In boiling water it swells and absorbs about 5 to 6 per cent, which it parts with slowly. This mechanically included water may be expelled at 302 degrees Fahrenheit

without constitutional change in the gutta percha. Practically insoluble in cold dilute alcohol, its solubility rapidly increases



COAGULATING GUTTA LATEX.

with concentration of the alcohol. If boiled in absolute alcohol it loses 15 to 20 per cent of its contained oxidized resinous matter. It dissolves completely in pure ether but is insoluble in ether containing even a small amount of alcohol. It is partly soluble in hot spirits of turpentine, petroleum, olive oil and benzene. The best solvents are carbon bisulphide and chloroform. These do not cause it to swell, like caoutchouc, but solution proceeds from the surface inward. These solvents give cloudy solutions which on filtration are limpid and colorless. Evaporation of the solvent leaves the pure gutta percha as a wax like body.

Alcohol precipitates gutta percha from its solutions, and the inclusion of some of the solvent renders the material somewhat tacky, particularly if benzene is the solvent.

CHEMICAL PROPERTIES.

The gutta percha of commerce, as already noted, is not a simple substance, but a compound, or possibly a mechanical mixture of several allied materials occurring in more or less varied proportions, according to botanical origin or conditions of manipulation.

We are indebted to Payen for most of the facts concerning the chemistry of gutta percha.

Pure gutta percha may be prepared by dis-

solving the sample in carbon bisulphide, filtering, and evaporating the solvent in the air on glass. When purified in this way ordinary commercial gutta percha showed, according to Miller:

Pure gutta percha.....	79.70
Resins	15.10
Vegetable fiber	2.18
Water	2.50
Ash	0.52

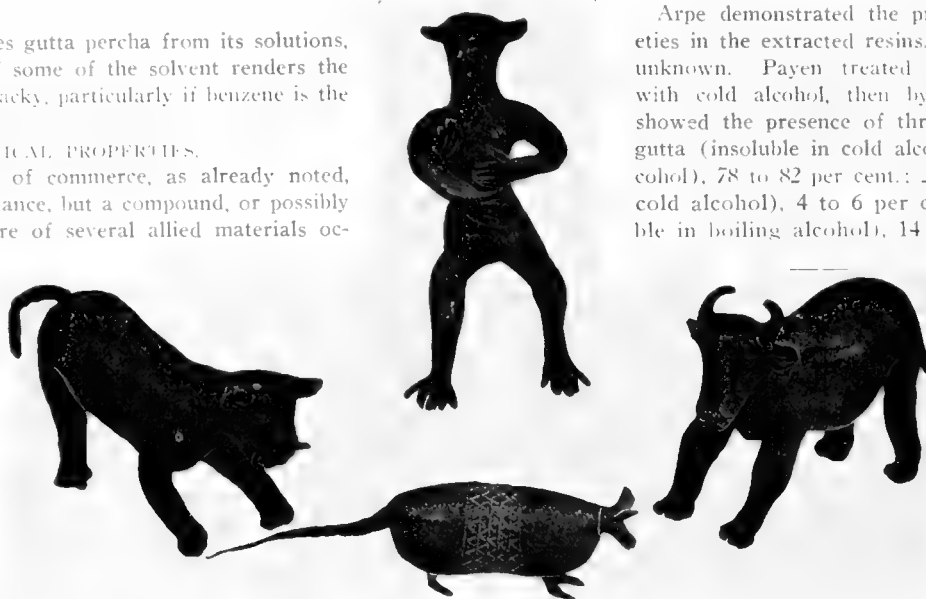
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Arpe demonstrated the presence of seven varieties in the extracted resins. Their constitution is unknown. Payen treated purified gutta percha with cold alcohol, then by boiling alcohol, and showed the presence of three distinct bodies: 1. gutta (insoluble in cold alcohol and in boiling alcohol), 78 to 82 per cent.; 2. fluavile (insoluble in cold alcohol), 4 to 6 per cent.; 3. albane (soluble in boiling alcohol), 14 to 16 per cent.

The separation of these bodies is effected by treating purified gutta percha for several hours with boiling alcohol and filtering. After standing one or two days the alcoholic solution deposits considerable opaque granular matter. The granules contain a nucleus of fluavile, covered with a crystalline incrustation of albane. By repeatedly washing this granular mass with cold alcohol the fluavile is dissolved and the albane remains.

Payen obtained pure gutta as a residue from boiling alcohol extractions. Oudemans in 1858-59 investigated gutta fluavile and albane, determining their properties and analysis. His results are given as follows: Gutta is solid, pliable, extensible, but not malleable between 50 and 85 degrees Fahrenheit. It softens about 120 degrees Fahrenheit and assumes a dark brown coloration, becoming more viscous and transparent as the heat increases.

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FIGURES MODELLED FROM GUTTA.



SACRED COW.

At 212 to 230 degrees Fahrenheit it spreads into a soft paste, and liquifies at 266 degrees Fahrenheit, beginning to boil at that temperature, and distills into several hydrocarbides, analogous to those obtained from the distillation of rubber. In presence of acids, dilute alcohol, ether and chloroform, it behaves like rubber. Pure gutta is insoluble in ether and light petroleum spirit at ordinary temperatures, while fluavile and albane readily dissolve. According to Arpe, gutta is not insoluble in ether unless previously treated with alcohol. Treatment with nitric acid causes liberation of formic and hydrocyanic acids. In form of powder it rapidly absorbs oxygen; hydrochloric acid gas trans-



FIGURE 1. A GUTTA TREE WITH HOLLOW CHISEL.

turns it into a brownish black substance, contracting on its surface with the appearance of leather. It is very unstable and may best be preserved in a solution of common salt. Elementary composition of gutta (Oudemans):

	1.	2.	3.
Carbon.....	87.64	88.10	88.20
Hydrogen.....	11.79	11.77	12.00
Oxygen.....	0.57	0.13	
	100.00	100.00	100.00

The corresponding formula for gutta would be $C_{10}H_{12}$. The results of Oudemans regarding the elementary composition of gutta,

sists dilute acids and alkaline liquids and is rapidly destroyed by sulphuric and nitric acids. Elementary composition of gutta (Oudemans):

	1.	2.
Carbon.....	83.36	83.82
Hydrogen.....	11.17	11.42
Oxygen.....	5.47	5.06
	100.00	100.00

Corresponding with the formula $C_{10}H_{12}O$.

Mani is a white, crystalline resin, which under the microscope is transparent to light, but less so than water.



GUTTA WAREHOUSE, ROTTERDAM.

all the above are confirmed by Bammler and establish the opinion that commercial gutta percha contains a hydrocarbon, $C_{20}H_{32}$, mixed with different oxidation products. Distillation decomposes gutta in the same way as rubber. Pure caoutchouc and pure gutta (the amorphous part of gutta percha) may be regarded as two isomeric compounds of the same series.

Thiavile is a yellowish, transparent resin, a little heavier than water. At 32 degrees Fahrenheit it is hard and brittle, softening at about 122 degrees, pasty at 140 degrees, and fluid at 212 to 230 degrees Fahrenheit. It decomposes at higher temperatures. It is soluble in the cold in alcohol, ether, benzene, spirits of turpentine, carbon disulphide and chloroform. On evaporation of its solvents thiavile is deposited as an amorphous mass. It re-

melts at about 300 degrees Fahrenheit, and is not acted on by hydrochloric acid. It is soluble in benzene, spirits of turpentine, carbon disulphide, ether, chloroform and boiling absolute alcohol. It crystallizes on cooling from its solutions. Elementary composition of thiavile (Oudemans):

	1.	2.
Carbon.....	78.87	78.95
Hydrogen.....	10.58	10.31
Oxygen.....	10.55	10.74
	100.00	100.00

Corresponding with the formula $C_{10}H_{12}O_2$. By heating to 266 degrees Fahrenheit it is changed to $C_{10}H_{12}O$ (F. J. C. Oudemans).

What the Rubber Chemists Are Doing.

PRESENT STATUS OF SYNTHETIC RUBBER PRODUCTION.

DR. F. W. HINRICHSSEN in the "Zeitschrift des Vereines Deutscher Ingenieure," discusses the present situation in regard to the synthetic production of rubber or caoutchouc. There is not today the enthusiastic interest in the matter that existed a few years ago, although it is one of great scientific importance.

Dr. Hinrichsen in his review confines himself to the essentials of the problem, observing that a complete history of its development is impossible, because only a small part of the work done along this line in commercial laboratories has come to the attention of the public.

After Harries in his basic research work in 1905 had determined the chemical constitution of natural rubber, $C_{10}H_{16}$, as that of a 1,5 dimethylcyclooctane of the formula



of the rubber itself. At present there is no possibility of serious competition of artificial with plantation rubber as regards price.

As regards practical utility synthetic rubbers seem to lack the durability of natural rubber because the latter, by its vegetable origin, contains a series of associated substances, resins, albumen, etc., which undoubtedly have an influence on its durability, for it is well known that deresinated rubber is much more easily attacked by the oxygen of the air than rubber containing resin. Possibly these associated substances act as protective colloids which reduce the vulnerability of the pure substance.

A further reason why synthetic rubbers are inferior to natural rubber in mechanical properties is that the former are not uniform substances but mixtures. According to recent investigations of Steimmig, in the oxygen splitting of synthetic rubbers there appears in addition to Coulinic acid and Coulinic aldehyde, which, according to Harries, correspond to natural rubber, resinous acid and acetyl-acetone.

The two last mentioned substances indicate that in the polymerization of isoprene, in addition to the 1,5-dimethylcyclooctanes, a smaller amount (20 per cent.) of the 1,6 compound must have been formed by abnormal condensation, which, upon being split by means of ozone, furnishes the two components mentioned. The latter have never been found in natural rubber. Until possible to arrange the conditions of polymerization so that the synthetic rubbers will constitute uniform compounds, it is not to be expected that synthetic rubbers will equal natural rubber in its useful properties.

SULPHIDE AND SULPHATE SULPHUR AND THE ACTION OF SOLVENTS ON VULCANIZED RUBBER.

The presence of metallic sulphides and sulphates in technical rubber articles complicates the estimation of the "combined" sulphur or "coefficient of vulcanization." Ordinarily the free sulphur and that present as substitute are extracted with acetone and alcoholic potash respectively. In the absence of sulphides and sulphates an estimation of sulphur in the residue gives the percentage in combination with the rubber. In the presence of sulphides and sulphates it is usual to heat a portion of the residue with high boiling point solvents to destroy the rubber and render it soluble. The sulphur is then estimated in the washed mineral residue. The sulphur is also estimated in another portion of the extracted rubber, and the sulphur combined with the rubber estimated by difference.

The method is unsatisfactory and has two disadvantages. First, many vulcanized rubbers are decomposed with difficulty. They carbonize and cake even at carefully regulated temperatures. Consequently the residue, after washing with benzene contains undissolved organic matter which protects the decomposition of the mineral sulphides. Second, the method assumes that the vulcanized rubber does not react with basic substances, such as litharge or magnesia, present in the mixing during heating, with formation of metallic sulphides, although vulcanizing temperatures are employed.

The method described below is applicable to those sulphides decomposable by heating with acids. It is, therefore, suitable for the estimation of the sulphides of zinc and lead. The metallic sulphides in either vulcanized or unvulcanized rubbers are so protected by the rubber surrounding the mineral particles that the surface only is attacked by prolonged boiling with strong hydrochloric acid solution. If the vulcanized rubber be first swollen in a suitable solvent in which the aqueous acid is partly soluble, the metallic sulphides of lead and zinc are easily and completely decomposed. Ordinary methylated ether has been found the most suitable solvent. If preferred, benzene or one of the chlorinated hydrocarbons, such as dichlorethylene, can be employed. Liberated hydrogen sulphide is estimated and calculated to percentage of sulphide sulphur.

Estimation of hydrogen sulphide by oxidation to sulphuric acid does not prove satisfactory. Best results are obtained by

precipitation in lead acetate solution. The absorption is very complete in the first bottle. The freshly precipitated and washed sulphide is decomposed by shaking with iodine solution.

ESTIMATION OF SULPHIDE SULPHUR.

To determine the sulphide sulphur, 20 c.c. of concentrated hydrochloric acid and 30 c.c. of ether are placed in a Voigt's flask (a flask having a ground in stopper carrying an outlet tube and a side inlet tube which passes through the side of the flask and reaches nearly to the bottom). The air is expelled from the flask by a current of carbon dioxide. The flask is then connected with an absorption apparatus containing lead acetate solution and a weighed quantity of rubber is introduced. The rubber swells gradually and after about 15 minutes the ether, together with evolved hydrogen sulphide, is driven over into the absorption apparatus by gentle heat. The decomposition is completed by boiling the mixture a few minutes. Traces of hydrogen sulphide are removed by a current of carbon dioxide and the lead sulphide is collected, washed and titrated iodometrically.

ESTIMATION OF SULPHATE SULPHUR.

The residue in the Voigt flask, containing the sulphates is extracted repeatedly with hydrochloric acid and the sulphates determined as barium sulphate.

ACTION OF SOLVENTS ON VULCANIZED RUBBER.

Ether, in presence of hydrochloric acid, gradually dissolves vulcanized rubber at the ordinary temperature, and the dissolved rubber contains about 1.5 per cent. sulphur. A mixture of benzene and hydrochloric acid also dissolves vulcanized rubber. Chlorohydrocarbons act similarly to the mixture of solvents and hydrochloric acids, but are no more rapid than a mixture of benzene and acids.

REAGENT FOR RUBBER ANALYSIS.

Douglas F. Twiss, in analytic work on rubber, finds that a mixture of equal parts by volume of concentrated hydrochloric acid and ether acts readily on rubber mixings at ordinary temperature, the penetration of the acid being greatly facilitated by the swelling action of the ether. The use of a similar mixture has been proposed by H. P. Stevens as the basis of his method for the estimation of free sulphur in rubber mixings.

Another application for this reagent is the neutralization of accelerators, such as litharge, before attempting the removal of free sulphur from rapid curing mixings. Where necessary to examine the content of combined sulphur in a partially cured rubber mix which contains much mineral accelerator and free sulphur, the conversion of the accelerator into an inert substance before the acetone extraction has the advantage of removing the likelihood of vulcanization during extraction.

To effect such purpose the procedure used is to treat 1 to 2 grams of the rubber with the acid-ether reagent until this reagent penetrates throughout the mass. The progress of the action, in presence of litharge, is easily followed by the change in color. The change is usually completed in a day. The rubber mass can then be removed or the ether evaporated. The mass is next washed in running water and dried. It is then ready for acetone extraction and the combined sulphur estimated in the residual rubber. If mineral sulphates are absent, the sulphur in the extracted rubber may be considered as organically combined sulphur. It is safer to begin with two samples and to estimate the total free and combined sulphur in one and free sulphur in the other. The above process appears to be desirable where there are large quantities of free sulphur and accelerator. In the opposite instance the method of Stevens is pronounced perfectly satisfactory.

PATENTED TREATMENT OF RUBBER.

IMPROVED COMPOSITION FOR RUBBER THREAD.—British patent No. 14,355 (1914), W. P. Bradley. Addition of 2 to 7 per cent. each of lampblack and ceresin wax to the quantity of rubber used.

The lampblack affords protection from the injurious effects of light and its action increases the effective resistance to oxidation, preserves tensile strength and elasticity and minimizes surface abrasion.

TREATMENT OF LATEX FOR EXTRACTION OF RUBBER.—United States patent No. 1,145,351, Samuel C. Davidson. The inventor's object is to eliminate the "resinous, protein, gummy and oily constituents of the latex" from the coagulated rubber and bring into intimate mixture with the latter precipitated sulphur from solution of a sodium or potassium thiosulphate by the addition of dilute acid.

United States patent No. 1,146,851, Samuel C. Davidson. In addition to sulphur precipitated from alkaline polysulphides the inventor adds to the latex "alkalized cresol" as a preservative.

PRODUCTION OF CAOUTCHOUC FROM ISOPRENE.—United States patent, 1,146,253, Arthur Heinmann. The process consists of first passing a substantial amount of free ozone through isoprene while maintaining the latter at a low temperature, and then heating the product to a temperature of approximately 105 degrees C. for a time sufficient to effect polymerization.

PATENTED RUBBER SUBSTITUTE.—E. Serre, French patent No. 474,220 (1913). In the preparation of a chlorosulphide rubber substitute the oil undergoing treatment with sulphur monochloride is mixed with a "moderator" the function of which is to reduce any dichloride present, and absorb any excess of monochloride remaining after the reaction and compensate by the dilatation of one of its constituents (retene), the contraction of the mass on solidification: 820 parts by weight of cottonseed oil is mixed with 20 parts of "moderator," consisting of flowers of sulphur, 1; sylvestrene or pinene, 2; cottonseed oil, 12; a retene, 5 parts; and vulcanized with 160 parts of sulphur chloride. The product is adapted for filling motor tires.

TREATMENT OF RUBBER LATEX.—A. Woosman, English patent No. 6,215 (1914). Smoke from a furnace is passed into a chamber, in which is an open pan containing latex, and is distributed by a baffle within the pan. A horizontal cylindrical drum, provided with perforations and grooves, rotates and churns the latex with the smoke.

REGENERATING RUBBER.—C. E. Anquetil, French patent No. 473,787 (1913). Vulcanized rubber waste is saturated with a chlorine derivative of ethylene or methylene, such as trichloroethylene, either by exposure to its vapor in a chamber heated to 60 degrees C., or by immersion in the liquid for not longer than 2 hours. The mass becomes very friable under this treatment, and can readily be freed from impurities by crushing and passing it through a sieve. The portion passing the sieve is dissolved by one of the usual solvents and the rubber precipitated by pouring the solution into a mixture of alcohol and acetone. The process of solution can be carried out in less than 2 hours.

SYNTHETIC RUBBER MANUFACTURE.—A. Haas, French patent No. 473,971 (1913). Starchy material is heated in a hermetically closed vessel with about 1 per cent. of rubber latex at 40 degrees C. for several days. The fermented product is transferred by means of air pressure into a second vessel containing a mixture of tetrachloroethane (2 parts) and trichloroethylene (1 part). By means of a steam coil the temperature is raised to 80 degrees C., and under this treatment the mass becomes completely anhydrous. By the pressure of the gases generated in the second vessel the fluid mass passes by a pipe into a third vessel, containing a solid hydrocarbon (such as camphor or its substitutes) to the amount of 4 per cent. of the original starchy material. The product is finally drawn off from the third vessel and freed from solvents by distillation. The residue is said to "possess all the properties of rubber."

COAGULATION OF LATEX.—R. C. Fulton and D. A. MacCullum, U. S. patent No. 9,066 (1914). Rubber latex is coagulated and cured by treatment with aldehydes or ketones other than formaldehyde in an inert carrier or diluent such as water, but excluding alcohol. For example 80-90 parts of water are added to

10-20 parts of aldehyde or ketone, and this diluted solution may be used with about half its volume of latex, which is preferably poured or sprayed over the coagulant. Formation to the extent of one per cent. may be added to the latex before coagulation.

INSULATING VARNISH.—Carl Baeder, United States patent No. 1,149,171. A composition comprising a resinous base, linseed oil, rubber, sulphur, acetate of lead and an oxygen compound of manganese yielding a dry residuum with low electrical conductivity, great flexibility and low degree of brittleness. [The inventor has evidently overlooked the deleterious effect of manganese compounds on rubber.]

PROCESS FOR MAKING CAOUTCHOUC SUBSTANCE.—Kurt Gottlob, United States patent No. 1,149,577. This consists of twenty-four claims, the gist of which is the process of producing a caoutchouc substance by polymerizing isoprene or a butadiene hydrocarbon in a dilute aqueous solution of egg albumen, emulsifying the mixture during polymerization and finally separating the caoutchouc substance.

CAOUTCHOUC SUBSTANCE AND VULCANIZATION PRODUCT.—Fritz Hofmann and Kurt Gottlob, United States patent No. 1,149,580. The process of producing vulcanized rubber by incorporating with rubber a small amount of an ammonium compound having a dissociation constant than 1×10^6 , and having a basic reaction at the vulcanizing temperature, and heating this mixture with a vulcanizing agent to effect vulcanization. Aldehyde and acetaldehyde ammonium compounds are referred to.

PROCESS FOR MAKING SOLID PLASTIC SUBSTANCES OF GLYCERINE AND GELATINE.

Solid plastic substances, such as are used for covering printers' rollers are made by melting together various combinations of glycerine, gelatines, coal tar, vegetable tar, wood pitch, resin, turpentine or rubber mixed with sulphur and camphor, together with some hardening agent like formaldehyde. A new German patent provides for replacing the camphor, which is an expensive addition, by aliphatic and aromatic acid esters, such as vinegar, benzo acid ester, and the like, or by acid ester oxides, such as sour milk, salicylic acid ester; sulphur also to be used as well as formaldehyde. The compound is passed through a calender and vulcanized for 30 minutes at 238 degrees F. [German patent No. 284,708 (1911), Julius Stockhausen.]

NATIONAL EXPOSITION OF CHEMICAL INDUSTRIES.

President Wilson has been invited to open the National Exposition of Chemical Industries on Monday, September 20, at the Grand Central Palace, New York City. This exposition will be an important event in the history of the industries dependent on chemistry, and can not fail to be far reaching in its results. Elaborate exhibits are arranged, many as working units showing the processes or apparatus in actual work.

Among the organizations co-operating to make this exposition a success are the American Chemical Society, the American Electrochemical Society, the American Institute of Mining Engineers, the American Institute of Electrical Engineers, American Pulp and Paper Associations, Technical Section, and the Bureau of Economics.

The program of meetings and papers is one of unusual interest. Important papers will be presented on scientific, industrial and trade topics. A great variety of moving pictures will be shown daily, illustrating a wide range of manufacture—chemical, electrical and metallurgical.

Eight bureaus in the Department of Commerce, Interior and Agriculture will present noteworthy and instructive exhibits. A few exhibitors of special interest to the rubber trade are the American Hard Rubber Co., the Automatic Weighing Machine Co., the Buffalo Foundry & Machine Co., the Boonton Rubber Co., the Condensite Co. of America, the J. P. Devine Co., Eimer & Amend and the General Bakelite Co.

The Manufacture of Balloon Fabrics in Europe.

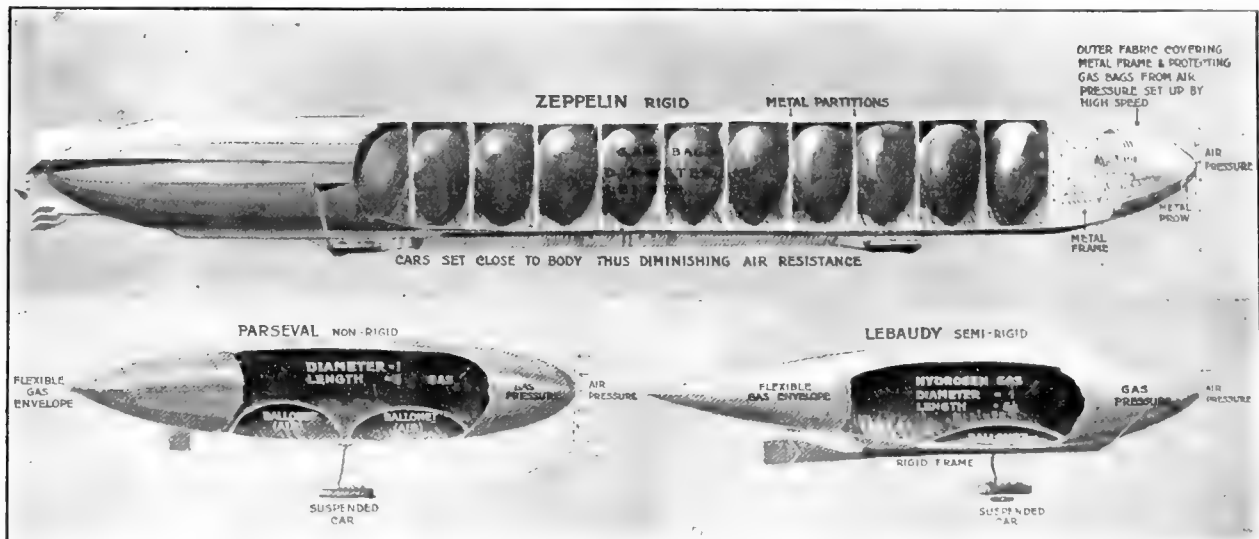
IN balloon construction rubberized fabrics are used much more extensively than for aeroplanes, for dirigible fabrics must be gas-proof and at the same time have great tensile strength. Fabrics treated with linseed oil will not hold hydrogen and are therefore useless. Dirigible balloon bags are made of "doubled" cotton fabrics, the layers being held together by two thicknesses of rubber—one of pure gum, uncured, the other of vulcanized Para; and the inside of the whole is coated with vulcanized rubber.

These "doubled" fabrics weigh from 320 to 340 grams per square meter (1.04 to 1.10 ounces to the square foot), and their tensile strength is from 1,400 to 1,500 kilograms per running meter (78.39 to 83.99 pounds to the inch) on fabric 0.3 millimeters (0.118 inches) in thickness. Acetate of cellulose is also used for coating balloon fabrics; for, like triacetate varnish, acetate of cellulose allows the balloon fabric to retain all its suppleness and does not injure it as does linseed oil. Fabrics coated with this composition are absolutely hydrogen gas-proof. Linseed oil is used for coating spherical balloons on account of

threads are used for both weft and warp. Careful calendering takes out all folds and creases. The fabric must be thoroughly washed and dried before being rubberized. Once this is done the fabric is passed through a calender, the rubber is spread and the fabric allowed to season in a place neither too dry nor too humid. The following table gives the characteristics and price in marks and dollars (before the war) of six sorts of cotton balloon fabrics manufactured by a leading German company:

Nos.	Weight in grams, (10.432 grains, troy) per square meter (10.76 sq. feet)	Number of threads per square centimeter (1.55 sq. inches)	Breaking load per centimetre (3.937 in.)		Price per square meter	
			Warp	Weft	Marks	Dollars
1	320	56	480	400	1.40	0.33
2	320	54	600	500	1.44	0.34
3	320	54	700	500	1.30	0.30
4	320	52	700	500	1.25	0.29
5	115-117	52	1,250	1,200	1.45	0.34
6	130-138	47-44	1,400	1,500	1.60	0.39

Nos. 1, 3 and 5 answer practically all purposes. Fabric No. 1 is made especially for small aerostats, such as registering bal-



TYPES OF DIRIGIBLE BALLOONS.

its low cost, but the fabric lasts much better when treated with acetate of cellulose.

FABRICS.

Silk and cotton fabrics are most generally employed in the making of balloons. Pongee silk is considered best, but silk taffeta is also used. The advantage of silk is that it is very light for its great strength. Its disadvantages are its cost, its tendency to become brittle and the faculty it has of accumulating electricity. The ramie fabrics, employed in the construction of some French aeroplanes, do not take rubber easily, and for that reason their role in balloon construction has been limited.

Cotton fabrics are probably best suited and certainly most generally used in the construction of balloons. Egyptian and East Indian are considered best, the English, Bohemian and Alsatian weaves being the most highly favored. The thickness of these fabrics varies from 0.015 to 0.037 millimeter (0.00059 to 0.00146 inch). Fibers vary in length from 20 to 30 millimeters (0.78 to 1.18 inch), and the very best English balloon fabrics are made of Lea-Ashland-Mako cotton. The threads must be evenly twisted, perfectly round and of the same thickness throughout. The same number and the same weight of

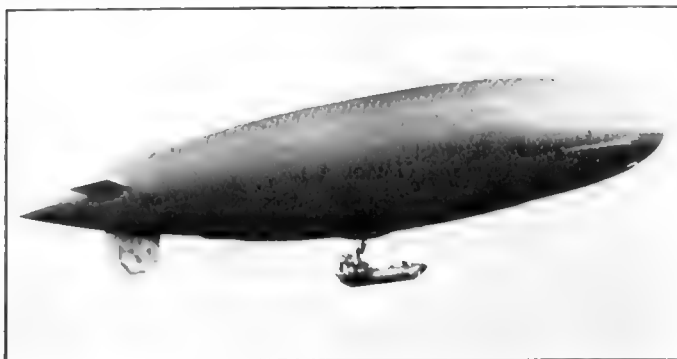
loons, where it is used single-fold. It also is used, "doubled" (double-fold), for making the compartments of large dirigible balloons, such as the Zeppelins, in which the plies are assembled parallel, and in French balloons of the "Zodiac" make, where it is employed in making the inside "balloonets" or air sacks used for "trimming" the balloon. Fabric No. 3 is used single-fold for the outer cover of "Zeppelins" and "Schutte-Lanz" dirigibles; also for building signal balloons and kites, while doubled, it serves in the construction of small dirigibles of the "Ruthenberg," "Lebaudy," "Zodiac" and "Clouth" types; also for spherical balloons. Fabric No. 5, doubled, is used in building dirigibles like the "Suchard." Used in combination with one another, or used singly, the three types of rubberized fabrics

Nos. 1, 3 and 5 offer almost unlimited possibilities. Cheap fabrics are always full of knots, bare spots and other irregularities and therefore cannot be considered as proper for balloon construction. Further, they are heavy and not easy to rubberize.

COLORING.

The coloring of rubberized balloon fabrics is of fundamental importance, for light and ultra violet rays are especially dangerous to

Experiments made by the noted French scientist, Victor Henri, demonstrated that chrome yellow and lead chromate and aniline yellow absorb ultra-violet rays and nullify their effects. In France the first is most popular, in Germany the second is most employed. Tightly



"PARSEVAL" (GERMAN NON-RIGID).

woven fabrics help to prevent the penetrating effect of light, but the yellow color is essential to save balloon fabrics from the ultra-violet rays and their destructive effects.

As sulphur combines easily with the chromate, it is difficult to vulcanize fabrics that are colored with lead chromate, the combination of lead and sulphur producing lead sulphide, which is black. This inconvenience is overcome by simply coating the colored layer of fabric with pure Para uncured and vulcanizing the rubber coating of the second layer of fabric which is placed underneath the colored one in making up the doubled fabric. It is also possible to vulcanize chromed-colored fabric by heat without seriously affecting its color, but great care must be exercised. Aniline yellow is also very sensitive to vulcanization, but it also can be easily handled. Unless treated with considerable care aniline yellow-dyed fabrics turn to a greenish yellow which affords no practical protection against ultra-violet rays. Chrome-yellow fabrics will stand bright sunlight for months without alteration, but it is very difficult to obtain a uniform color with chrome yellow.

METALLIZED FABRICS.

A great step forward was made when "metallized" balloon fabrics were introduced. The outer surface of these is covered with a thin coat of metal, which is blown on to the fabric in a



GERMAN NON-RIGID.

vacuum of the light gases, on to the slender which has been previously dissolved in a solution. The powdered metal clings to the surface of the fabric, which is then rolled and smoothed in a calender. The result is a fabric which is almost impervious to the light rays of the sun, and the

humidity of the air. Aluminum is not affected by sulphur or any of the other fillers usually employed in the manufacture of rubberized fabrics. Water runs off metallized balloon fabrics, which also throw off sunlight, destroying the action of both heat and of ultra-violet rays.

CHOICE OF RUBBER.

Only the best of crude rubber can be used for balloon fabrics and extra fine Pará hard cure is best of all. For this use the difference there is between fine Pará soft cure and fine Pará hard cure is of very great importance. The hard cure is obtained by more intense smoking and is easily recognized by the fact that its different layers are easily detachable from one another. Soft cure Pará comes in balls, the several layers of which it is very difficult to separate. Pará entreline, Sernamby, negroheads, as well as African rubber, are not suitable for balloon fabrics. Well smoked plantation sheet rubber and Peruvian ball rubber can be used in part, but they must not exceed 40 per cent. of the total, and great care must be exercised in vulcanizing, for plantation as well as Peruvian rubber requires a greater addition of sulphur. A mixture of soft cure Pará or weak Pará, both irregular gums, or a mixture of resinous rubber would create difficulties in



ZEPPELINS IN THEIR SHED (RIGID).

vulcanizing and the gumming would turn to resin in a very short time.

VARIOUS MIXINGS.

The washing and drying of rubber for the manufacture of balloon fabrics does not present any peculiarities not known to rubber manufacturers. The same remark applies to the mixing. Mr. Churret, a French chemist, recommends the following compounds which have given good practical results:

MIXTURE A, for mixing fabrics gas-tight	Kilos.	Pounds.
Fine Pará hard cure (vulcanized at 135° C.)	4.000	8.8184
Paraffin (point of fusion 13° C.)	0.030	0.0661
Sulphur (crude sifted)	0.300	0.6618
Calcined magnesite (twice sifted)	0.110	0.2425
MIXTURE B, to increase the tensile strength of the fabric:		
Fine Pará hard cure (vulcanized at 135° C.)	4.000	8.8184
Paraffin (point of fusion 13° C.)	0.040	0.0881
Calcined magnesite (twice sifted)	2.000	5.7319
Calcined magnesite (twice sifted)	0.360	0.7936
Paraffin (point of fusion 13° C.)	0.400	0.8818
MIXTURE C, to obtain gas-tight fabrics by cold vulcanization:		
Fine Pará hard cure (vulcanized at 135° C.)	4.000	8.8184
Paraffin (point of fusion 13° C.)	0.500	0.1102

As these compounds must be dissolved after mixing, the following rules laid down by Mr. Churret should be followed:

"For mixing and massing, a mixer with cylinders about 1 meter (39.37 inches) will be used. The mixtures should never contain more than 8 kilograms (17.64 pounds) of rubber, and each of the ingredients should be weighed in clean containers.

"For mixture A the Pará should be worked 1½ hours in the mixing machine, then the rubber is wound around a mandrel

and cooled. The cylinders also are cooled until they can be handled. The rubber is put back into the mixer and worked up again; the paraffin is then added by rubbing it on to the rear of the cylinder with the hand. When a perfect mixture is obtained it is again removed and allowed to cool for a half hour. The same process is followed in adding the sulphur and the magnesia.

"For mixture B the process is the same except that the magnesia and the magnesia carbonate are added at the same time. The magnesia must always be added before the sulphur, for it is very light and slow in mixing and the mixture becomes soft and very hot. Were the sulphur added while the mixture is hot it would be possible for vulcanization to commence in the mixing machine; the mixture must therefore be allowed to cool for at least an hour and a half before the sulphur is added.

"To spread the mass on the fabric it is of course necessary to dilute it. Either benzol or benzene may be used as a solvent, but the latter is preferable. The solution of benzene must be perfectly free of water and all the ingredients must be handled in perfectly clean vessels. The boiling point of the benzene must not be lower than 70° Centigrade (174° Fahrenheit) nor higher than 100° Centigrade (212° Fahrenheit). The part of the benzene that does not boil above 100° Centigrade must not exceed 8 per cent., for the table of the spreading machine would have to be too highly heated and, even then, the solvent might not be completely evaporated. This evaporation is very important, for the slightest bit of benzene would turn to gas during the vulcanization and make it impossible to obtain a gas-proof fabric. But the evaporation of the solvent must not be too rapid, for bubbles would possibly form and the finished material would not have sufficient strength to withstand the high gas pressure to which it is necessarily subjected when in use. The fabric must pass slowly over the heated table of the spreader to allow ample time for the complete evaporation of the solvent.

"The rubber mixture should always be dissolved slowly and should not be allowed to stand, lest the sulphur should crystallize. The mixture is rolled into a thin sheet, which is shaken in the solvent, a perfect pulp being thus obtained. It is advisable to make two solutions of the same mixture—a 'long' or thin one and a 'short' or thick solution. The first application of the solution must penetrate the pores of the fabric as far as possible, and for this purpose a thin solution is better than a thick

one. For lining the fabric the thick solution is best. In preparing the mixture it must be borne in mind that rubber is affected by the rolling it is subjected to; the more rubber is worked in the mixer the less its elasticity and the greater its adhesive qualities. Rubber is also differently affected by solvents. Rubber that has been kneaded a long time by warm cylinders requires less benzene than cold-rolled rubber.

SPREADING.

"The spreading must be performed in a room well ventilated and free from dust. The spreading machine must be established on a heavy, firm foundation and driven by cut gears, so as to eliminate vibration as far as possible and to obtain perfect regularity in running. Spreading cylinders should be perfectly smooth under the knife. The rubber coating must have a certain hardness. If it is too hard the fabric is compressed and weakened; on the other hand, if it is too soft, the fabric forces itself into the gum and the layer is consequently uneven in thickness.

"The knife of the spreading machine must be perfectly sharp in order that the layer of rubber may be well spread. If the rubber catches on the back of the knife and forms clots, they should be removed with a wet knife. This is very important. The table must be sufficiently heated to vaporize practically all the solvent by the time the fabric reaches the end of the table. Before spreading is begun the fabric must be perfectly dry. Coating begins with the spreading of the thin solution. The fabric is previously wound on a large drum, from which it passes on to a drum cylinder on which the spreading knife rests. The spreading knife is adjustable, so that one can obtain the desired thickness of coating. A

fabric weighing 90 grams to the square meter (3.086 ounces to every 10.764 sq. feet) will take from 8 to 10 grams of gum per square yard. The layers of rubber coating are applied so as to follow each other in opposite directions. Longitudinal as well as transverse folds or wrinkles should be guarded against. The spreader moves at a speed of about 17 feet per minute. It is therefore easy to follow the work and correct mistakes. Bias fabrics which have a tendency to contract and shrink should be passed through a smoothing calender before spreading is undertaken. Fabric should also first be dried for 24 hours in a special room and sprinkled with paraffined talcum powder which can be rubbed into the fabric by a brushing machine.

(To be Continued.)



GERMAN MILITARY CAPTIVE BALLOON.

Rubber Substitutes and Their Analysis.

BROWN reclaimed rubber came into vogue rubber substitutes were the only adulterants used in the European manufacture of rubber goods and even now their use has not been completely abandoned. The following paragraphs descriptive of different rubber substitutes are translated from a recent number of *Le Caoutchouc & la Gutta-Percha*:

Rubber substitutes, as indicated by the name, closely resemble rubber, with which they can be mixed, in proportions of one to one and even more, without materially affecting the elastic qualities of the rubber. This is due to the curious mechanical consistency of rubber substitutes which, although they have a great tensile strength, have a high degree of elasticity. When substitutes are added to rubber the latter's strength is reduced, but there is no proportional lessening of its elasticity. Substitutes containing neither mineral oils nor wax and having a density varying between 0.98 and 1.020 are the only substitutes that can be used in combination with floating rubbers other than black rubber, and they are therefore of considerable interest.

White substitutes were discovered during the first half of last century and brown substitutes later on, and the manufacture of both has been perfected in the last decade. Rubber substitute is the result of the reaction of sulphur chloride at a moderate temperature—80 to 100 degrees Centigrade (176 to 212 degrees Fahrenheit)—or of sulphur at a higher temperature—160 to 200 degrees Centigrade (320 to 392 degrees Fahrenheit)—on crude or blown oil. Many features of the manufacture of rubber substitute resemble those of the manufacture of rubber itself.

Different oils are used, according to the market price, but best results are obtained with castor oil or rape oil. The reaction of sulphur chloride produces a slightly colored substitute commercially known as white substitute or white factice. Pure sulphur produces brown factice or brown substitute. When blown or oxidized oils are used the amount of the sulphur or of the sulphur chloride addition can be materially reduced, which is an advantage in white substitutes where high vulcanization temperatures injuriously affect the stability of the composition. The usual amount of sulphur does not exceed 6 or 7 per cent. for white substitutes, whereas brown substitutes can contain from 7 to 20 per cent. of sulphur. Cheap qualities of soft sulphur can be used only for strongly oxidized oils and produce quite different substitutes from those made with fine sulphur, which is generally used with crude oils.

Rubber substitutes are solid substances of about the same consistency as stiff jelly. They will not dissolve in rubber solvents, which will, however, swell the substitute into a light jelly. Although rubber substitutes are, as a rule, chemically inert, they are essentially saponifiable. Alkaline alkalis decompose rubber substitutes easily; alcoholic alkalis readily change them into glycerine and fatty acids that produce alkaline salts which are soluble in water. Brown substitutes are most generally used in compounds that are to be heat cured. White substitutes are used for cold cured articles and, in small quantities, in heat cured compounds.

The normal composition of rubber substitutes is as follows:

1. Non-vulcanized fatty oils.
2. Free sulphur.
3. Rubber substitute properly so called, containing sulphur and chlorine.

Many brown substitutes also contain mixtures of paraffin and mineral oils. These are mixed with the oil before vulcanization, but the mineral oil has no advantage from its manufacturing cost. The adulterators do not consider the addition of mineral oils as constituting a fraudulent adulteration as the adulteration is not due to the presence in the substitute and

Brown substitute is sold commercially in compact cakes measuring 10 x 30 centimeters (4 x 11½ inches). White substitute comes either in irregularly shaped amber colored pieces or in the form of a white powder of light consistency and having the appearance of bread crumbs.

It is important to note that the chemical composition of compact rubber substitute is not homogeneous but varies considerably from one point to another. For this reason the analysis of a shipment cannot be determined by analyzing a small fragment of it; at least a pound must be taken and worked cold in a mixing mill or calender.

ANALYSIS OF RUBBER SUBSTITUTES.

Two grams of substitute are placed in a funnel filter on top of purified cotton and are extracted with acetone during 10 hours in a Saxhlet or in a Knofler extractor. The extract is then dried at 100 degrees Centigrade (230 degrees Fahrenheit). It contains:

1. Non-vulcanized oil.
2. Non-saponifiable substances.
3. Free sulphur.

The presence of paraffin is characterized by its crystallization in the acetone; the presence of mineral oil by its fluorescence.

Non-vulcanized oils are only slightly soluble in acetone and often settle in heavy drops. This product is not composed of non-modified fatty oils, for they always contain from one to two per cent. of combined sulphur. However, it is really oil, very distinct from the substitute that is a gelatinous solid, so that the designation "non-vulcanized oil" is not a misnomer.

DETERMINATION OF SULPHUR

For this purpose one of the methods for determining the proportion of sulphur in vulcanized rubber can be used. The most expeditious method is to treat the extracted acetone with sulphur-saturated petroleum, but this system can only be adopted where there are large quantities of sulphur and when the crystals have settled. The Davis and Fouchard process gives very exact results where there are small or even large quantities of sulphur, but this process is not reliable where there is chlorine, as in white substitutes. The method by oxidation presents the disadvantage that the small quantity of combined sulphur that is in the substitute is also oxidized and the figure representing free sulphur in this manner slightly increased. Large quantities of sulphur denote defective preparation of the substitute. White substitute generally contains from one to two per cent. and sometimes more free sulphur that is produced by the reaction of the sulphur chloride on the oil. The presence of free sulphur may also be due to a reversion of the substitute after its manufacture.

PROPORTION OF NON-SAPONIFIABLE SUBSTANCES

The proportion of non-saponifiable substances is determined by treating the acetone extract of 2 grams of substitute, the extract being boiled for two hours with 40 c.c. of normal alcoholic potash.

The subsequent treatment varies according to the kind of non-saponifiable substance. This is easily discovered by cooling the alcoholic potash or by diluting it with water. When the non-saponifiable part is liquid, like vaseline or mineral oil, the alcohol should be distilled, the residue taken up with water and extracted twice or even three times with ether, the ether extract decanted, evaporated, dried at 110 degrees Centigrade (230 degrees Fahrenheit) and weighed. If the non-saponifiable part is solid, like paraffin or ceresin, or extracted by petroleum ether, the alcoholic liquid is not evaporated, but an equal volume of water is added and then extraction

is performed by using petroleum ether. Aqueous alkaline solutions or slightly alcoholic solutions cannot easily be extracted with petroleum ether on account of the formation of persistent emulsions. The petroleum solution is separated, then washed, first with a small quantity of concentrated sulphuric acid, then with a solution of one-half normal alcoholic potash, and finally it is evaporated and dried in the usual manner.

PROPORTION OF NON-VULCANIZED OIL

After the free sulphur and the non-saponifiable substances are removed from the acetone extract, the non-vulcanized oil is obtained. The residue that is non-soluble in acetone is vulcanized oil or factice.

DETERMINATION OF SULPHUR AND CHLORINE COMBINED

To determine the proportion of sulphur and of chlorine combined from .5 gram to 1 gram of brown factice is taken from the acetone extraction residue and treated according to the method of Henniquoz or according to that of Pontro. The substance is slowly heated in an iron retort with 10 grams of caustic soda and 10 per cent. of alcohol. This causes the factice to dissolve. The solvent is then slowly evaporated, one liter of water added and the whole strongly heated while it is constantly being stirred. The organic matter is heated until it smokes and thickens into a magma that shows a tendency at some points to become incandescent. Then peroxide of sodium is slowly and progressively added in small portions with a spatula while the stirring is continued.

As the peroxide is added the liquid becomes more and more fluid and finally becomes black through the formation of ferrates. Care must be taken to divide the peroxide so that it will be thoroughly mixed with the mass and will thus produce uniform oxidation. The mass is then cooled and treated with water. If there is no chlorine the solution is acidified with hydrochloric acid, boiled and precipitated by chloride of barium. Where there is chlorine, the solution is divided into two parts, which are acidified, one with hydrochloric acid, the other with nitric acid, and the sulphur contents determined with barium chloride and the chlorine by nitrate of silver.

DETERMINATION OF TOTAL SULPHUR, MOISTURE, FREE ACID AND ASH

The total sulphur can be determined by one of the usual methods applied to the original substitute. The combined sulphur is always found rather low in brown substitutes.

Moisture is rarely determined in brown substitute. When the decomposition of white substitute is rather advanced, it contains a small percentage of moisture. It may be determined by drying at 60 degrees Centigrade (140 degrees Fahrenheit).

There is always free acid in rubber substitutes, but the amount rarely exceeds 2 per cent., figured as oleic acid. It is rather harmless or not more troublesome than non-vulcanized oil. In substitutes that are in a state of decomposition free sulphuric acid is often found and it can be determined by washing the substitute in hot water and by titrating the sulphuric acid in the wash water by barium chloride.

Ash amounts to about 1 per cent. in brown substitutes and is of no importance. In manufacturing white substitute a little lime or magnesia is often added to neutralize the hydrochloric acid created during decomposition.

The proportion of ash in white substitute is not generally determined quantitatively, but only examined qualitatively.

The following figures, quoted from "Le Caoutchouc & la Gutta-Percha," are for typical rubber substitutes:

WHITE SUBSTITUTE		TYPICAL GRADES	
Non-vulcanized	90	10	10
Free sulphur	1	0.8	1.1
Acetone extract (oleic acid)	1	86	87
Combined sulphur (combined with extract)	1	6.7	6.4

BROWN SUBSTITUTES WITH HIGH HYDROCARBONS		TYPICAL GRADES	
Non-vulcanized	75	77	72
Free sulphur	1	1	1
Acetone extract (oleic acid)	1	1	1
Combined sulphur (combined with extract)	1	0.1	0.1

BROWN SUBSTITUTES WITH LOW HYDROCARBONS		TYPICAL GRADES	
Non-vulcanized	75	77	72
Free sulphur	1	1	1
Acetone extract (oleic acid)	1	1	1
Combined sulphur (combined with extract)	1	0.1	0.1

In general the best substitute is the one that contains the least non-vulcanized oil because the effect of this oil is the same as if the oil were simply mixed with the rubber, that is, it lessens the life of the rubber. Mineral oils are less dangerous, in this connection, than vegetable oils, and paraffin is entirely neutral.

For mixing rubber with the above substitutes, the following proportions may be adopted: Thirty parts of French Para. substitute may be added to 100 per cent. of rubber, with 8 or 9 per cent. of paraffin. As a matter of fact paraffin can be even used in a greater proportion.

The proportion of ash in a substitute must not exceed reasonable limits, 4 per cent. for instance, and should contain more of magnesia than lime. Magnesia, with a little oil, produces a non-deliquescent oxide. The presence of hygroscopic substances causes rubber substitutes to decompose while in storage.

To recapitulate, the best substitutes are those that, in their crude state, are driest and least coherent, the sulphur and chlorine together not exceeding 20 per cent.

Brown substitutes, and sometimes white substitutes, offer a great variety of mechanical consistencies, according to the ratio of non-vulcanized and non-saponifiable ingredients to the combined sulphur. The low vulcanization of these qualities makes soft products that are sticky and gelatinous. Well vulcanized, on the contrary, they are firm and strong. These properties are of the greatest importance in determining the substitute to be used in a given mixture.

Substitutes as received should be extracted with acetone to determine the free sulphur and the non-saponifiable parts. Rubber substitutes of the same make should not vary greatly in consistency, and the percentage of extract should remain constant in the rough, about 2 per cent. The mechanical properties of substitutes of different makes can only approximately be determined by analysis. For instance, two samples, made of different oils, may give the same acetone extracts and the same percentage of combined sulphur and yet be very different. In such cases mixing and vulcanization tests should be made.

The knowledge of the percentage of free sulphur is important for figuring compounds. More than 3 per cent. denotes either defective manufacture or reversion while in storage.

Methods for analyzing oils are applicable only to a slight extent to rubber substitutes, and the indications they give concerning the raw materials used are misleading and of little interest to the rubber manufacturer.

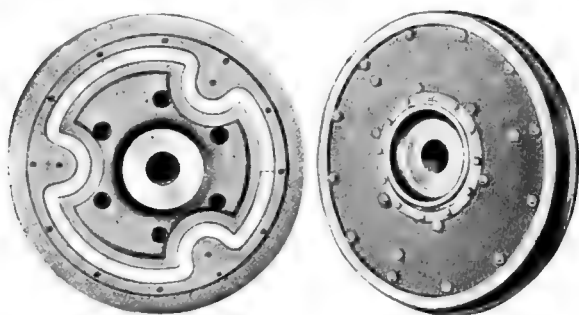
The figures representing saponification in substitutes are always higher than those for oils, and are not constant unless rigorous methods are employed. They are in the neighborhood of 300 for white substitute and 100 for the brown. The proportions of fatty acids play an important part in the general analysis of rubber.

Should the reader require further information, Crude Rubber and Compounding Ingredients, Rubber Chemistry of the American Rubber Trade Directory of the World.

New Rubber Goods in the Market.

RUBBER IN CAR WHEELS.

THE introduction of rubber into car wheel construction opens a field of interesting possibilities to the rubber manufacturers. Such a wheel has not only been designed and patented, but has been in use since early in April and is said to have substantiated the claims of the inventor for the elimination of the rattle and jar of the car. This Madden Silent Wheel is constructed on the principle of a wheel within a wheel, the curved recesses preventing the inner wheel from revolving except as the outer one revolves. The two wheels are separated by a rubber cushion, as shown in the white curved line in the interior view of the wheel, the other view showing the wheel with side plates attached to hold the inner wheel in position and prevent side motion.



The wheel itself is designed to give 300,000 miles service, and the rubber inner tire or cushion, as well as the outer wheel tread, can be replaced when worn out. The wheels at present in use have already run over 7,000 miles, and they are still running in test service. The makers believe that the rubber cushion can be greatly improved, and they invite the co-operation of rubber manufacturers toward this end. As 26 pounds of rubber is used in each wheel, with eight wheels to a car, and as there are in use in the United States at the present time about 100,000 trolley cars and 60,000 railway passenger cars, besides about 2,500,000 freight cars—for all of which this wheel is adapted—its adoption by the street and steam railways throughout the country would mean a great increase in rubber consumption. [Madden Silent Wheel Corporation, 1180 Broadway, New York.]

THE ANGLE-TREAD NON-SKID TIRE.



The usual procedure in tire manufacture in the past has been to have the non-skid portion of the tread run about half way down over the side walls, beyond the point where it comes in contact with the road. The illustration shows a type of tire in which this custom is not followed, but where the tread is made higher in the center, where the tire is subjected to the most wear. This feature, and a scientific arrangement of the corrugations, are supposed to add considerably to the tire's wearing qualities. [The Marathon Tire & Rubber Co., Cuyahoga Falls, Ohio.]

In the new "Crazy Cab" adjustable and detachable stormproof top designed for the Ford runabout, the curtains are

of a rubber covered sail duck. [Fouts & Hunter Co., Terre Haute, Indiana.]

"INDESTRUCTIBLE" GASOLENE HOSE.

The cut below, a photographic reproduction of a section of a new type of "Indestructible" hose, tells its own story. The manufacturers of this hose are guaranteeing it to withstand the action of gasoline and oil and offer to replace it without



charge if it becomes unserviceable from the action of gasoline; and the hose is so branded, the guarantee providing, however, that it must not be used for any other purpose than conveying gasoline and oil. [New York Belting & Packing Co., New York.]

THE "BESTYETTE" WATER BOTTLE.

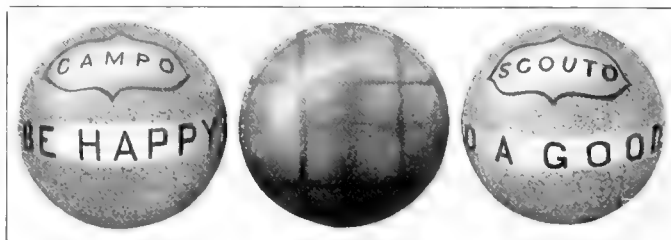
This is a seamless, narrow-neck bottle, made of tough and durable rubber stock over a solid core. The stopper is integral with the bottle and is not wired to the neck or held in place by a piece of friction tape, but is really part of the article itself.

The unusual qualities claimed for this bottle by the manufacturer are demonstrated by a series of novel tests. The bottle is inflated until it is five times its normal size, subjected to an air pressure of forty pounds; then two men stand on the inflated bottle, which stands this severe test without rupture or break. The illustration was made from a photograph of a "Bestyette" bottle taken after being subjected to the above mentioned tests. It will be seen that it retains its uniformity and has not lost its shape. [N. Y. Mackintosh Co., Mamaroneck, New York.]



NEW RUBBER BALLS.

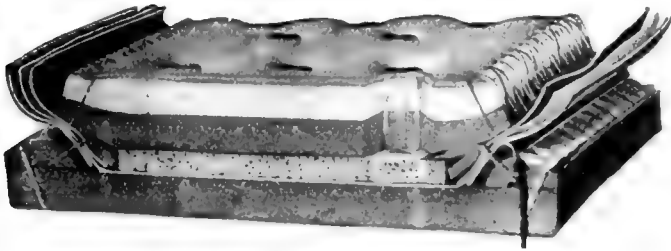
The cut below illustrates three balls that have just come on the market, although the design of two of them, the "Campo" and the "Scouto," was mentioned on page 194 of our January issue. These two balls, as their names imply, were designed for use by the Camp Fire Girls and the Boy Scouts, two very popular



organizations whose membership now includes a large number of the young people throughout the country. On the Campo ball, the words "Be Happy. Give Service"—two of the seven parts of the club law—appear in raised letters on a band around the center of the ball; on the Scouto are the words "Do a Good Turn Daily." The blanket ball in the center is in bright colors in plaid effect. [Goodyear Rubber Co., Milwaukee, Wisconsin.]

A NEW TYPE OF WATERPROOF SHOE.

The "Dry-Sox" is a new line of shoes in which the waterproof effect is produced in a novel manner. The illustration shows the part that rubber plays in its make-up, a rubber welt being sewed in with the leather welt to prevent water



from getting between the welt and the out-sole. This, the manufacturers claim, makes as waterproof a leather shoe as it is possible to produce. [F. Mayer Boot & Shoe Co., Milwaukee, Wisconsin.]

A RUBBER DENTAL BLOCK.

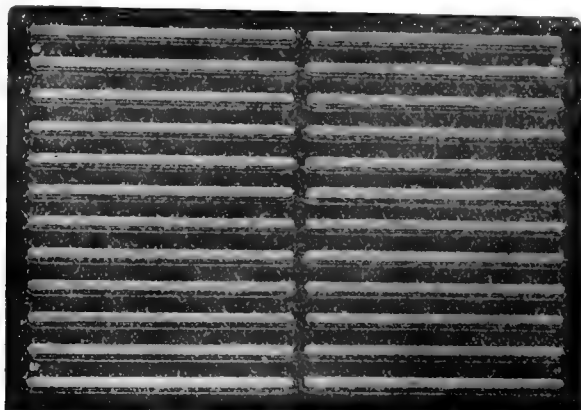
The best filing surface in dressing a vulcanite denture is a



cushion of soft rubber, and the cut herewith shows an improved dental block which consists of a cast-iron frame and a rubber block that has just the slight give which permits of easy and accurate filing. The rubber blocks, which are made in two sizes to fit different sized frames, are readily replaced when worn out. [The S. S. White Dental Manufacturing Co., Philadelphia.]

STEP PLATE WITH RUBBER STRIPS.

The Stanwood Safety Step Plate is a new device composed of a series of semi-pliable rubber segments inserted in an embossed metal plate covered with a baked on enamel in imitation of gray rubber. The rubber segments project one-



eighth of an inch above the perforated containing plate and can be replaced in the event of damage or when worn. The step, besides insuring a firm foothold, prevents the tracking of mud and water into the car. [Automatic Appliance Co., Boston.]

THE MOTORCYCLE TIRE WITH THE BLUE STREAK

As the motorcycle is being constructed for a wider range of usefulness than in the past, there is naturally a call for better tires, and the "Blue Streak" tire, made with a distinguishing blue circle around the center, has been produced to meet this demand. The blocks on the tread are bigger, come up farther on the side, giving better traction and wear, and the carcass has four plies of fabric and a breaker strip, practically placing it in the automobile tire class. The heavy tread blocks not only make the tire attractive but so overlap each other as to permit a flat and regular tread and on rough roads serve as a protection against cuts and punctures. [The Goodyear Tire & Rubber Co., Akron, Ohio]



RUBBER IN THE "AERO-PHONE."

The rush of the wind and the deafening roar of the propeller discourage conversation between the pilot and the passenger in an aeroplane, and a special telephone equipment is required to



make such conversation possible. This apparatus is called an "Aero-phone" and consists of two double-head telephone receivers and two special types of chest transmitters. The receivers, which are of hard rubber, are held against the ears by a spring head band so that practically all the disturbing noises are excluded. The special transmitters are provided with soft rubber caps and are strapped to the chest at a point below the collar-bone and above the third rib. In speaking, the chest muscles transmit the voice vibrations to the transmitter.

The receivers and transmitters are connected by suitable cords which terminate in a small plug, the plug being inserted in a jack mounted in the frame-work of the aeroplane. One of these jacks is provided for each occupant. The battery required consists of three standard telephone dry batteries, which will provide continuous service for 100 hours.

The simplicity and efficiency of this apparatus especially adapt it to use in the military branch of aerial work, where it is essential that aviator and passenger be in communication at all times. [Western Electric Co., New York.]

A NEW USE FOR THE RUBBER BAND

An inexpensive card case for the vest pocket is made effective for holding a dozen or fifteen cards by means of a simple flat rubber band. One cover is lined with cardboard folded to fit the back of the covers and returning as a narrow flap to bear upon the cards, the power to hold which is obtained by an encircling rubber band.

NEW 'CRAVENNETTE' MATERIALS AND STYLES

A new material to be called "Krutabae" is being offered in numerous weights and colors for ladies' misses' and children's coats, suits and for general utility wear. It is cravenette proofed, and among the advantages given over other materials in such uses are that it repels moisture but does not induce perspiration or stop ventilation, so that it maintains warmth to an extent equal to double its weight in other fabrics. The sport coat illustrated is made of this new material. [French & Ward, 79-81 Worth street, New York.]

"KAMP-IT"

The "Duxbak" brand of special woven cravennetted camping and sports clothing has been familiar for a number of years to sportsmen and campers-out. This season the makers have brought out a new material



of lighter weight, called "Kamp-It," in which some unusually attractive garments for both women and men are being offered. This material is made of specially woven cotton and is cheaper than Duxbak, the rain-re-



sisting qualities of which it also lacks. In ladies' garments the manufacturers are showing new styles in riding breeches or bloomers, also a new riding coat.

The lower illustration shows a new style in a trap shooter's jacket. It has the English pivot sleeve expansion back and capacious shell pockets supported by flaps extending over the shoulder. [Bird, Jones & Kennerly, Inc., New York.]

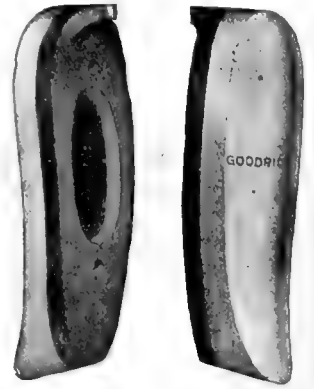
GUN RECOIL PADS

Kamp-It is the new material for the trap shooter's jacket. It has the English pivot sleeve expansion back and capacious shell pockets supported by flaps extending over the shoulder. [Bird, Jones & Kennerly, Inc., New York.]



pads have been placed on the market, of which those illustrated herewith are the most recent.

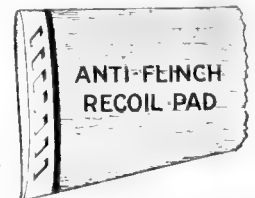
The first cut shows two views of the improved H. R. B. pad. This pad has a soft face of high grade rubber, curved to fit the shoulder. It has a tough, durable base of hard rubber, inseparately connected with the soft rubber part by a special strip. The oval air chamber through the hard rubber base is continued, in enlarged size, into the soft rubber part, extending about half way through the pad and under practically the entire surface of the soft rubber cushion. The extent of this air chamber is supposed to give the pad unusual shock absorbing qualities. It is made in three sizes and can be buffed to fit any butt. [The B. F. Goodrich Co., Akron, Ohio.]



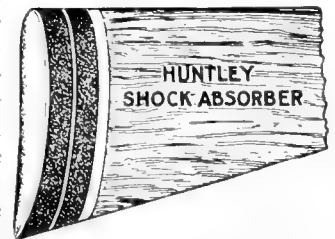
The Perkins shock absorber, on the left, is made of soft red rubber, and is joined to the gun or rifle by rubber cement and screws, as illustrated. This pad can be bent in any shape to fit any gun and is claimed to be the only pad on the market that can be extended and contracted. It is neat in appearance, three-quarters of an inch thick, and is made in six sizes. [John W. Perkins, Everett, Massachusetts.]



The Anti-Flinch recoil pad, which is made by the Jostam Manufacturing Co., of Chicago, is a molded soft rubber cushion vulcanized to a hard rubber base plate. Through the soft cushion are oblong holes slanting at an angle of 45 degrees in line with the stock. Between these holes there are walls of rubber that fold each on the other when the gun is discharged and spring back into normal position when the pressure is released, thus taking up the recoil. These walls of rubber are further supposed to eliminate the upward whip of the muzzle at the time of discharge and to maintain balance of the gun for second shot. [Hilbard, Spencer, Bartlett & Co., Chicago.]



The Huntley shock absorber was designed by S. A. Huntley, one of the best shots in the country, whose record has gained considerably through its use. It is composed of layers of high grade sponge rubber between, the object of this particular construction being to absorb the shock through the consistency of the sponge rubber, without the quick rebound that the pure rubber pad gives. The gasket rubber on the outside, next the shoulder, adds to its durability. It is made in two sizes and at prices varying with the number of layers in the pad. [The Huntley Manufacturing Co., Omaha, Nebraska.]

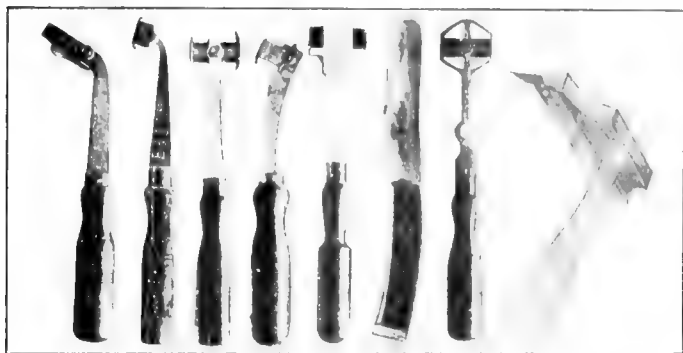


"Holdrite," a new puncture and blow-out patch, is made with a coating of cement which increases in adhesive strength as the tire becomes heated by friction. This patch is also constructed with a special canvas backing to prevent it from stretching and to hold the edges of the cut closer together. [The Surridge Holdrite Patch Co., Grand Rapids, Michigan.]

The Editor's Book Table.

A HANDBOOK OF TROPICAL GARDENING AND PLANTING. BY H. L. MACMILLAN, F. F. S. C. R. H. S., Superintendent of Royal Botanic Gardens, Ceylon. Illustrated. Second Edition, Pp. 114. Gilt. H. W. C. & A. C. [Cloth, 8vo, 662 pages.]

THE author is an authority of highest rank in matters pertaining to tropical agriculture and in this work presents a well-arranged compilation of reliable information of much interest and value. The chapters are grouped in four sections. Section 1 covers general conditions of climate, soils, manures, propagation, cultural operations, plans, implements and tools. Section 2 discusses the fruit and vegetable varieties, spices, etc. Section 3 is devoted to tropical flowering plants and foliage trees, many of which are of un-



SOIL TAPPING KNIVES IN USE

usual beauty and interest. Section 4 deals with the standard economic vegetable products of Ceylon, principal among them being rubber, tea, cocoanuts, cocoa, rice and tobacco.

It may be of interest to condense from the chapter devoted to rubber which gives in detail all the essentials regarding the usual methods or systems of tapping. The various knives and pricking tools which are used for making incisions of the bark are illustrated. Different systems of tapping are employed because some are better adapted than others to certain species and to trees of different ages. Nearly all are on the system known as "herring-bone" or "half-herring-bone." The latter sometimes is called the "half-spiral" system. In the case of the *Hevea* tree the usual method is to mark the circumference of the stem, up to about five feet from the base, into quarters. One quarter at a time or alternate quarters on reverse sides may be operated on simultaneously. This area is marked off usually with two wide V's cut about a foot apart vertically, and joined by a vertical central channel. A thin shaving, not less than 20 to the inch, is taken off the lower side of each cut every alternate day or so until the intervening space of bark becomes too narrow or exhausted of latex when the operation may be repeated on a fresh quarter of the stem. The tapping may thus be extended over almost the whole year. Each succeeding year the opposite or adjacent quarter may be operated upon, the whole area thus occupying from four to six years, by which time the renewed bark on the first quarter should be ready for retapping. The special forms of knives used are designed to prevent the incisions from penetrating the cambium layer and thus producing a knotted condition of the stem. If the cambium be much injured the life of the tree will be affected.

The process of coagulation of the latex is usually accelerated by addition of a little more than one per cent. of acetic acid. The rubber quickly forms as a wet floating mass and is removed for machine washing and making into the commer-

cial forms of crepe, sheet or block. Smoke curing on plantations is at present in an experimental stage.

The rubber producing trees, shrubs and climbers are described and botanically catalogued and much information is given concerning the principal species.

The work concludes with chapters on miscellaneous products, insect pests, fungic diseases, etc. The author has rendered an important service in the preparation of this handbook which is more valuable by the inclusion of a good index.

RUBBER INSULATED WIRE. BY DRS. BENZ AND FRANK. PUBLISHED BY THE UNION DEUTSCHE VERLAGSGESAMTSCHAFT, BERLIN, GERMANY. Pp. 114. 47 illustrations, paper bound.

This is an interesting monograph on the manufacture and applications of insulated wires and cables. After giving a brief history of the use of rubber and gutta percha for insulating wire, it describes chronologically the whole process of manufacture of rubber and gutta percha insulated wires and cables, the preparation of the raw materials, the impregnating of fabrics, insulating mixtures; the machinery used in cable factories for insulating both wire and cable; wrapping machines, insulating machines, longitudinal cable rolling mills, etc.; the tanning and testing of rubber and of gutta percha insulated wires and cables, and the manufacture of Okonite and other insulating materials containing either rubber or gutta percha. This joint production of Messrs. Benz and Frank should prove a valuable book of reference to all interested in cables and insulated wire. The text is in German.

PURCHASING. BY C. S. RINDSBOOS, C.E., PRESIDENT OF THE United States Purchasing Corporation, McGraw-Hill Building, New York. Pp. 274. Pp. 114. 165 pages, 27 illustrations.

Hitherto there has been no literature dealing adequately with the important subject of purchasing, considered in its fundamental relations. This concise text book gives a clear presentation of the author's views based on his practical experience and comprehensive study of the problem.

The subject is treated topically in ten chapters, beginning with how to obtain the right article and the importance of special knowledge relating to its use, supply and manufacture. The matter of aiming at the lowest price calls for use of competitive bids treated under various methods of tabulation and analysis. Prompt delivery, emergency orders and expecting the impossible, and the value of the perpetual inventory are naturally grouped for discussion. A brief chapter discusses making purchases conform to a fixed policy. This is followed by chapters on Securing Favorable Terms; Personal Characteristics and Qualifications; Strategy; Legal Aspects, and Departmental Organization, concluding with a chapter of terms.

The gist of nearly every chapter is briefly and conveniently summarized.

Purchasing agents who study this book as it deserves, can not fail to be benefited by the intelligent views and practical methods advocated by the author.

INVESTORS BLUE BOOK FOR 1915. EDITED BY GEORGE F. HARRIS, JR., Editor of "The Money Market Review and Investor's Guide." Pp. 114. 165 pages, 27 illustrations.

The object of this work is to give, in convenient form, all the essential details on some 1,700 important corporations and the 7,500 companies which are quoted on the London and provincial exchanges, and in addition, the editor's opinion regarding these various companies and securities. This information is arranged in a convenient plan and in alphabetical order by companies.

An attempt is made to forecast the effect of the European war on the yield of securities. The British Government, it is considered, will be borrowing on a 4 per cent. basis, and indus-

the company is expected to fall 10 per cent and rubber shares 10 per cent, owing to expanding outputs and declining costs, despite reduced selling price of the product. The editor treats the top of the balance sheet analytically as a virtual prospectus of the company, that light by the prospective investor. The section on "Selecting a New Issue," contains much sound advice and information. Under the statement concerning the affairs of each company is found an opinion summing up the investment value of the shares. These opinions are valuable and evidently are unprejudiced and independent. The book is in three alphabetical sections, treating, in order, Government and Municipal Issues, Joint Stock Companies and Securities Classified.

The book easily ranks as the most complete and authoritative work of its kind.

RUBBER FACTS AND FIGURES, NO. 1, JUNE, 1915. COMPILED BY Frederic C. Matheson & Co., 16 Copthall Avenue, London, E. C. [Paper, 135 pages; price, one shilling net.]

This compact arrangement of tables presents in convenient form the essential facts and figures relating to rubber plantations under English control. Especial attention is directed to the reduction in costs of production since the last compilation and the expectation of the planters that these will be still further lowered this year. This will be brought about by improvements in management and field methods. Most companies are now thinning out trees, as with increase of size a smaller number of trees to the acre produce as much rubber as a larger number and permit a saving in tapping. In 1913 the exportation of plantation Pará nearly equaled that of all wild grade via Pará, and in 1914 surpassed the latter's exports by 14,000 tons. The book is of convenient pocket size and well adapted for reference.

NEW TRADE PUBLICATIONS.

"THE CARE AND REPAIR OF TIRES" is the title of a valuable handbook published by the Firestone Tire and Rubber Co., of Akron, Ohio, for the benefit of the pocket books of automobile owners. The object of the Firestone booklet is to educate motorists to eliminate unnecessary tire expense by telling them certain things they should know about the tires they use. Good tires will stand abuse, but there is a limit to their capacity to do so and motorists who will carefully read the instructions contained in "The Care and Repair of Tires" should easily be able to materially reduce their tire bills.

RUBBER AND GUTTA PERCHA MANUFACTURE.

The India Rubber, Gutta Percha & Telegraph Works Co., Limited, of Silvertown, London, has published for distribution a finely printed book of 34 pages containing well selected historical data concerning the origin and growth of the company, which began manufacturing in Greenwich in 1852. The departments mentioned are rubber, gutta percha, submarine cable, electrical, mechanical and testing. Much interesting technical information is to be found in the account of the manufacturing operations described, particularly that relating to cord motor tires, golf balls, submarine cable making and laying, instruments for electrical testing and operation of cables. The book is well illustrated, and some of the views show unique machines and applications. An appended list of the company's manufactures includes practically everything in rubber except shoes, clothing and druggists' sundries; certainly everything in gutta percha, and much in electrical instruments, machinery and electrical accessories.

PUBLICATIONS OF UNITED STATES BUREAU OF STANDARDS.

TESTING AND PROPERTIES OF TEXTILE MATERIALS. Circular No. 41. This is an account of the standard methods of testing raw and woven fibers, yarn, thread, twine and fabrics, concluding with general instructions regarding applications for tests and the interpretation of facts. It is a pamphlet of 16 pages.

ELECTRIC WIRE AND CABLE TERMINOLOGY. Circular No. 37. This pamphlet contains the definitions of terms used in the nomenclature of electric wires and cables, illustrated with views of cable sections. Stranding receives special attention. An illustrative discussion introduces the terms defined and shows their proper use in the context.

THE TESTING OF RUBBER GOODS. Circular No. 30. This is a third edition of the pamphlet entitled "The Testing of Rubber Goods." The new edition of this valuable publication of the Department of Commerce is double the size of the preceding edition. The physical and chemical sections include the Bureau of Standards' methods, fully detailed and illustrated. The book should be in the hands of every engineer or tests and every chemist who is concerned with the valuation of rubber goods. Copies are obtainable from the Superintendent of Documents, Government Printing Office, Washington, D. C., at 15 cents per copy.

CAOUTCHOUC.

The La Crosse Rubber Mills Co., of La Crosse, Wisconsin, has issued for advertising purposes a very attractive brochure entitled "Caoutchouc—The Story of the Manufacture of Rubber Footwear."

It is a well written account, profusely illustrated with selected views showing in systematic progression the manufacture of rubber from forest to the finished rubber footwear. In connection with the text the book gives a very clear presentation of an important branch of rubber manufacture of great popular interest. It is full of information, and has a genuine educational value for the general public. Presumably the book is for free distribution on application.

COMMERCIAL TREATIES OF THE UNITED STATES.

The National Trade Council, with headquarters in New York, has an authorized maximum membership of 50 merchants, manufacturers, railroad and steamship men and bankers, representing all sections of the United States and collectively standing for the general interests of all elements engaged in foreign trade. Samuel P. Colt, president of the United States Rubber Co., and Maurice Coster, foreign manager of the Westinghouse Electric & Manufacturing Co., are included in the list of members.

In anticipation of the responsibilities which will fall upon the United States when the world begins to repair the treaty relations destroyed or dislocated by war, the Foreign Relations Committee of the National Foreign Trade Council has caused to be prepared by Carman F. Randolph, of the New York Bar, a compact "Brief on Commercial Treaties of the United States." The brief lists and discusses the commercial treaties in force between the United States and other nations, and in an appendix embodies these provisions of existing treaties relating to commerce.

ELECTROLYTIC INSULATION OF ALUMINUM WIRE.

In a paper recently read before the American Electro-Chemical Society, C. E. Skinner and L. W. Chubb describe a process for the production of an insulating film of high dielectric resistance on the surface of aluminum wire. The best electrolytes are solutions of borax, borate of aluminum, and above all, sodium silicate. The coating obtained with the latter material has a dielectric resistance much greater than that of the coating of oxide obtained by other processes. Two wires so treated and tightly twisted together withstand a pressure of 200 to 500 volts.

The Draper-Maynard Co., of Plymouth, New Hampshire, has ready for distribution its illustrated catalog of athletic goods for the 1915-1916 season, as well as a new 40-page booklet giving the official football, basket ball and soccer football laws for the season, with illustrations of outfits. These rule books are for general distribution and may be obtained from dealers or from the company's offices direct. Similar rule books covering baseball and tennis are published about the first of January.

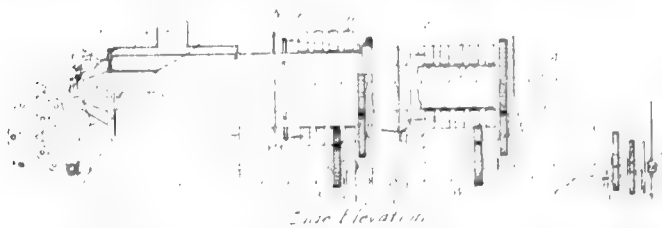
New Machines and Appliances.

MACHINE FOR MAKING HOSE OR TIRE CASING STRIPS.

THREE patents have recently been granted to John T. Fister for improvements in the method and machinery for making fabric tubes and strips from rubbered cords. The first invention covers a method of making strips of hose and tire forming fabric, the second covers a tire strip, and the third covers the apparatus for making the hose and tire fabric, which is herewith illustrated and described.

In the illustration, which is a side elevation of the machine, parts are shown in section and others are broken away to more clearly show the details. The machine is supported on standards on which are mounted or journaled the operative parts. *I* is the movable core about which are wound the groups of rubberized cords forming superimposed spiral layers, arranged at different angles to each other. The endless chain of core sections forming the core passes around the pulley *B* and between an inner and outer series of rollers *D* and *C* respectively, at the front of the machine. This endless chain also passes through the two hollow cylinders that revolve in opposite directions supported by the machine frames and standards.

The groups of cord *L* that form the inner layer of the strip are carried on spools *G*, which are fixed to the cylinder *I*. The outer layer is formed by the groups of cords *L* carried on spool *H*, attached to the forward cylinder *I*. The cords are rubberized by being passed through cement chambers *M* and *N*, and then through annular guides *O* and *P* to the annular winders *K* and *L*. Here they are wound spirally in opposite directions on the



endless moving core. To unite the layers of cord a strip of rubber stock is fed between them by the roller *V*. The rubberized cords are dried as they pass through the drying chamber *R* by a current of air drawn through the pipe *Q*.

The machine is operated from a motor, *X*, connected by gearing to the main shaft *F* which drives the cylinders in opposite directions through spur gearing *W* and *Y*. At the forward end of the main shaft is keyed a bevel gear that drives a cross shaft *U*. Attached to this shaft is a sprocket wheel and a chain belt *T* which drives the friction roller *D* that in turn drives the moving core *I*. Fixed to the shaft *F* is a motor counter that slits the fabric tube so that it can be removed from the core in the form of an open strip suitable for building up tire casing. The tension of the core chain is adjusted by a lever and hand screw *Z*. [John T. Fister, United States patent no. 1,147,254.]

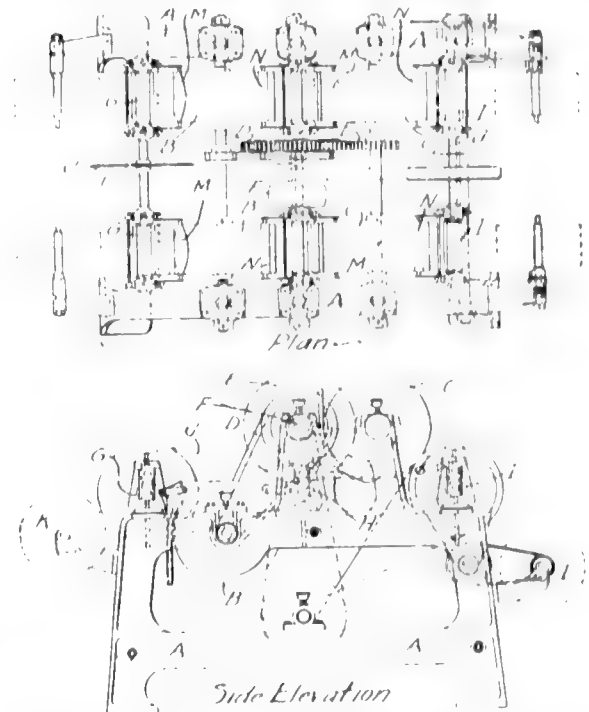
A NEW ABRADING MACHINE

In Blardell's machine rubber strip or sheet are roughened on both sides by being drawn between abrading wheels.

The same letters refer to the same parts in both the plan and side elevation views of the machine. The side frame *A* supports two pairs of oppositely placed abrading wheels *B* and *C* driven by belt *D* and spur gearing *E* from the main shaft *F*. The strips are drawn through the machine by pairs of rollers *G*, *H* and *I* driven by chain belt *J*. Tension is maintained on the strip by driving the front roller *G* at a lower speed than the rollers *H* and *I*.

Referring to the side elevation, the strip are fed from the stock spools *K* and after passing between the abrading wheel *B*

and *C* are wound up on the spools *L*. The strips are kept up to the wheels by roller rollers *M* and *N* shown in the plan view. The four rollers *M* in front of the abrading wheels are crowned



or elliptical in shape to equalize the abrading action over the surface of the strip. The particles of material removed are carried away through pipe *Y* by an exhaust fan *X*. As the strip leave the last pair of rollers they are passed over smoothing bar which remove the crease and wrinkle. [J. E. Blardell, British patent no. 8,121, 1914.]

BELTING AND PACKING MACHINE.

In Matthew's machine, belting is calendered, embossed with patterns and vulcanized by being fed in a narrow path around and between the surfaces of heated rotary cylinders. Referring to the drawing on the left the belting is fed from a reel *A* over the warming up cylinder *B* to the flanged main cylinder *C*, and is calendered by a heated cylinder *D*, which may travel at a higher speed than the cylinder *C*. The belting is then passed over the



calendering cylinder *E* and is pressed by one or more pressure rollers *F* and fed onto a finishing roll *G*.

In the form shown in the illustration on the right a series of upper and lower cylinders *H* and *I* are employed the latter being adjustable by screw *J*. The former is used for waterproof fabric and sheet and in other rubber. The whole apparatus may be enclosed in a casing. [P. M. Matthew, British patent no. 5,464, 1914.]

NEW COMB CUTTING MACHINE.

This is a German comb cutting machine that operates at the same time a set of fine and a set of coarse cutting saws and automatically causes one set of saws to take up the cutting work where the other set has left off.

This machine is composed of two side frames 2 between which a vertically movable frame 3 is mounted and bears two superimposed shafts 4, 4' on which the saws are keyed. The lower shaft 4' carries fine saws 5', while the upper shaft 4 carries coarse saws 5. Both shafts are driven from intermediate shaft 6, which is belted to shaft 7. The frame that bears the saw shafts slides vertically in the guides of the frames 2 of the machine and is raised and lowered by the rack 6. When this frame is in its highest position the coarse saws

5 are in working position opposite the piece to be cut. [German patent No. 626,519.]

APPARATUS FOR TESTING IMPERMEABILITY OF FABRICS.

The device illustrated herewith is for testing the non-permeability to water of textile fabrics, especially of cloth intended for military uniforms.

It consists of a glass cylinder *A*, open at both ends, graduated in depth in centimeters, with a flanged brass collar, to which the sample of cloth *B* to be tested is secured by a brass ring *C*, and bolts *D*. A tripod *E* with a stem pivoted at *F*, and an insulating portion *G*, carries a brass disc *H* upon which is laid a circular piece of thin paper *I*, which has been soaked in a solution of potassium sulphate, dried and waxed for a width of 1 centimeter (3/32 inch) round the perimeter. Upon the paper a disc of very thin wire gauze *J*, of platinum or gilt copper, is placed, and *H* and *J* are connected to the poles of a battery with a relay *K* in circuit, which, when the circuit is closed, actuates the style of a recording chronograph, immediately afterwards breaking the circuit and ringing a bell.

If a strong fabric proofed with rubber, the disc *B* is placed directly on the rubber; if rubber is not used, a space of 5 millimeters (1/8 inch) is left between *B* and *J*. Distilled water is poured into the cylinder up to a known depth, the electric circuit is closed, the chronograph is started. When at all the water penetrates the fabric, it moistens the paper and completes the circuit, actuating the relay. If artificial rain is to be used the cylinder is placed on a turntable on the table, the top of which is covered with a glass plate, and a set of

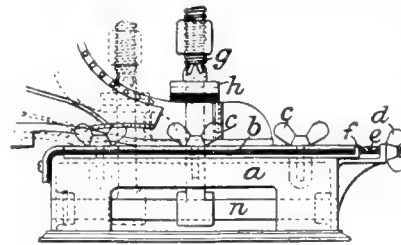
water from a capillary orifice is allowed to fall from a known height upon the cloth. Penetration is announced automatically, as above described. Thus, it is claimed, the water-proof qualities of cloth can be measured under standardized conditions.

Another instrument for measuring impermeability of cloth was described in THE INDIA RUBBER WORLD of June 1, 1915. Briefly, this consists of a copper cylindrical box to which a measuring glass tube and a rubber bulb are attached. The box and bulb are filled with water and the cloth to be tested is fastened to the top of the box. By pressing the bulb the height of water in the glass tube is increased and the water forced through the cloth. The height of the water column measures the impermeability of the fabric.

RUBBER SOLE PRESS.

This German device holds the sole firmly in contact with the boot, while the cement dries.

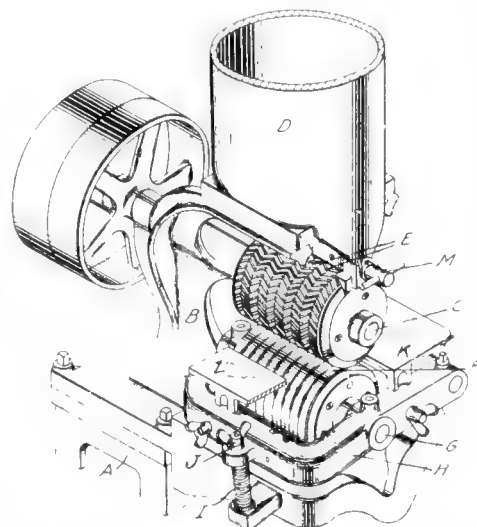
The frame of the press *a* supports the elastic bed *b* on which the soles of the boot rests. One end of the bed is attached to the frame and the other to a sliding frame *f* which is adjusted by a screw *c* and wing nut *d*. Clamping screws *e* hold the sides of the bed in position. The clamping pad *h*, operated by a screw *g*, and adjustable along the guide bar *n*, holds the boot and sole firmly in place. [Continental Caoutchouc & Gutta Percha Co., Hanover. British patent No. 6216-1914.]



RUBBER CEMENT APPLYING MACHINE.

In the manufacture of leather boots and shoes the edges of the soles, particularly at the shank portion, are skived. This results in a sole that is not uniform in thickness and therefore is improperly coated when run through a cementing machine of the ordinary type. Julian's machine overcomes this difficulty, how-

ever, by employing a lower roller of novel form. This is made up of circular sections, movable vertically by springs of sufficient strength to force the thinner portions of the sole against the upper cement roller so that all portions of the sole approximately lie in the same plane, insuring an even coating of cement irrespective of variations in thickness.



Referring to the drawing, *A* is the base of the machine and *B* the standard that supports the belt-driven shaft *C* upon which is fastened the cement-applying roller. Above this roller is the cement tank *D* provided with a nozzle and spreader that deliver the cement evenly to the roller *E*. Surplus cement is controlled by a flexible scraper located opposite the spreader and in contact with the cement roller.

The roller *F* is made up of separate rings held in position on the shaft *G* by vertically yielding springs. It is mounted in the swinging bracket *H* which is held in a raised position by the spring rod *I* and regulated by the wing nut *J*. The bracket *H* yields to accommodate soles of different thickness and the spring controlled rings of the roller *F* force the thinner portions of the sole into contact with the cement roller *E*. [Gideon J. Julian, assignor to United Shoe Machinery Co., United States patent No. 1,145,996.]

OTHER DEVICES.

A NEW TIRE.—McNaull's latest patent covers a novel method of attaching the beads to the fabric that forms the casing. Each bead is made up of three groups of wires. The margins of the six strips of fabric which extend across the tire, forming the casing, are folded around each opposite group of wires. An additional strip of fabric extends across the inner side of the casing covering the three opposite groups of wires, its margins overlapping the outside groups of wires and their coverings. [William D. McNaull, United States patent No. 1,147,032.]

AUTOMATIC MACHINE FOR MAKING TUBULAR FABRIC.—Subers has patented a machine for making unwoven laminated tubular fabric in continuous lengths on horizontal, moving mandrels from bands of cords previously impregnated with rubber. [Lawrence A. Subers, United States patent No. 1,145,446.]

A PORTABLE ELECTRIC VULCANIZER.—It is a small and compact car vulcanizer, operated by electric current of low voltage that is available from the storage battery usually carried in automobiles for lighting and ignition. [Oliver C. Dennis, United States patent No. 1,147,847.]

IMPROVED SLITTING AND REWINDING MACHINE.—Cameron has invented a new slitting method by which the spreading of the cut material is avoided. The circular cutter has two cutting edges which sever the web, producing a thin narrow strip which is either rewound with the cut sections or removed from the machine. [James A. Cameron and Gustaf Birger Birch, assignors to Cameron Machine Co., United States patent No. 1,148,146.]

METHOD OF MAKING WATER BOTTLES.—The body and neck portions are molded in a single piece over a core. The neck is formed with an opening so that the core can be withdrawn. [George E. Hall, United States patent No. 1,148,226.]

INNER TUBE TESTING AND TIRE CARRYING DEVICE. This is an annular trough-shaped receptacle made of any material that will hold water. It serves the two-fold purpose of a device for testing inner tubes for leaks and a tire-case adapted to be carried on the tire-holder of an automobile. [Jacob Closz, United States patent No. 1,148,287.]

AIR BAG FOR REPAIRING TIRES.—The bag consists of an inner tube and valve with outer covering of frictioned duck. It is used in the ordinary mold for repairing tire casings and when inflated holds the patch under compression and the outer surfaces firmly in contact with the walls of the mold. [Alvin L. Johnson and Alfred O. Alsten, United States patent No. 1,148,171.]

MACHINE FOR ARMORING AIR BRAKE HOSE.—In the manufacture of rubber hose for railway service and particularly the hose sections coupling the locomotive and tender, it is desirable to reinforce the hose by winding with wire. Sill has invented a simple and effective machine for doing this work. [Samuel J. Sill, assignor of one-half to Herbert H. Hewitt, United States patent No. 1,149,224.]

METHOD OF MAKING CORD TIRES.—The cords are made by twisting rubber-impregnated strands around a core of soft rubber. These are cut into equal lengths and laid parallel to one another on the annular core at an angle of 60 degrees. The bead cores are then applied and a second ply of cords is laid over the first at a reverse angle. [Richard Griffith, assignor to Miller Rubber Co., United States patent No. 1,149,364.]

PRESSURE CURE VULCANIZER.—Boots and shoes are vulcanized by being placed on lasts and enclosed in an envelope and then subjected to the action of heat and pressure in a vulcanizer. The envelope prevents contact with the air or live steam, thus eliminating oxidation. [Apsley Rubber Co., British patent No. 6,763, 1914.]

The United States patent No. 1,090,535, granted to William G. Hill, assignor to Apsley Rubber Co., Hudson, Massachusetts, apparently identical with the above, was illustrated and described in *THE INDIA RUBBER WORLD*, May 1, 1914.

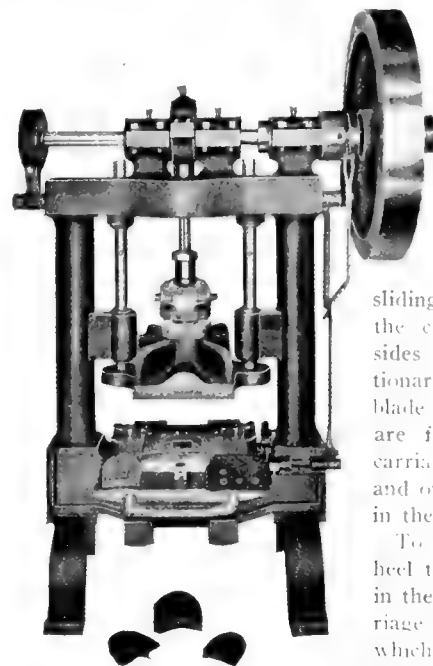
MANUFACTURING CONTINUOUS LENGTHS OF SOFT RUBBER COMBINED WITH HARD RUBBER. Solid tires with hard rubber foundation or solid tires with a metal rim, covered on both sides with hard rubber, are made by Gare's process. The soft and hard rubber compounds are separately fed into the mold, where they are formed and compressed by a plunger. The two bodies are brought in contact before passing through the heated part of the mold, where they are vulcanized together and extruded from the machine, a molded tire on a hard rubber foundation. [Thomas Gare, United States patent No. 1,146,072.]

A BELTING AND SHEET CALENDER VULCANIZER.—Belting, waterproof fabrics and sheet are calendered and vulcanized by passing them around a series of heated pressure rolls. [P. M. Matthew, British patent No. 5,464.]

A NEW BRAIDING MACHINE. Pneumatic tires are made on a vertical braiding machine adapted to support and slowly rotate a core upon which the casing is braided. When the braiding is finished the core is removed from the machine, the casing slitted around the inner circumference of this core and the braided fabric removed for subsequent treatment. [W. H. Dunkerley and T. J. Arnold, British patent No. 7,226, 1914.]

A NEW OVERFLOW TRIMMING PRESS.

The automatic machine shown in the accompanying illustration has been recently designed for trimming the rim or overflow from rubber heels, soles, horseshoe pads, valves and other mechanical goods made in molds.



It is constructed on the principle of an ordinary belt-driven punch press with a reciprocating plunger and operated by the usual trip rod. The heel die consists of two sliding jaws corresponding to the curve of the back and sides of the heel, and a stationary breast with a cutting blade attached. The die parts are fastened to the sliding carriage, which is moved in and out by the handle shown in the illustration.

To operate the machine, the heel to be trimmed is placed in the die cavity and the carriage is pushed forward, which action trips the press. The plunger head descends and strikes on the two vertical pins which force the sliding jaws together. These close tightly around the heel and against the breast, cutting through the overflow. The press then comes to a full stop. When the carriage and die are drawn out, the ejector throws out the trimmed heel, and another heel is placed in the die cavity and the operation repeated. [Rumrill & Co., Boston; Arthur J. Wills, North Brookfield, Massachusetts, sales agent.]

SHIPPING CARS EQUIPPED WITH TIRES DIRECT TO NEUTRAL COUNTRIES.

It will be recalled that the August number of this publication contained an editorial calling attention to the fact that while American rubber manufacturers had very carefully lived up to their agreement not to ship rubber goods to neutral countries in Europe except via London, some of their customers, notably manufacturers of motor cars, had not been so careful, as there had been repeated shipments of cars fully equipped with tires direct to neutral countries.

The Rubber Control Committee of the Rubber Club has sent out a letter, under date of August 4, covering this very matter. The letter states:

"The British government has officially called the attention of the Rubber Control Committee to the frequent violation of the provision of the bonds and guarantees respecting the shipment of manufactured rubber goods to neutral European countries. Since the American manufacturers gave their bonds and guarantees to the British government last winter in consideration of which they have since been securing their supplies of crude rubber, a number of consignments of rubber goods have been shipped direct to neutral European countries without evident regard to the clause in the bonds and guarantees providing that they 'will not sell any manufactured or partly manufactured rubber goods to any person in the United States without satisfying themselves that there is no intention on his part to export or re-sell the same for exportation to any countries in Europe other than Great Britain, France, Russia or Italy, otherwise than by shipping to the United Kingdom and re-shipping from there under license to be obtained for export therefrom.'"

The committee then goes on to say:

"The experience of six months has shown that while rubber manufacturers themselves have zealously adhered to the terms of their bonds and guarantees, some automobile and motorcycle manufacturers either do not sufficiently understand the importance of the situation or have not given the information thoroughly to all members of their organizations. As a consequence nearly every vessel clearing for Scandinavian, Dutch and Mediterranean ports has carried automobiles and motorcycles equipped with tires."

The British Foreign Office is considerably concerned over these violations of the guarantees and the committee is anxious that every rubber manufacturer should make every effort to see that none of his product when sold to an American customer shall find its way to a purchaser in a neutral country except by way of London, and it makes the following request:

"It seems desirable at the present time to assure the British Consul General at New York that American rubber manufacturers have taken adequate means to see that the provisions of the guarantees and bonds in respect to shipments to neutral European countries are being carried out. We, therefore, invite every rubber manufacturer signatory to a bond or guarantee to file with The Rubber Club of America, Inc., a statement of what they are doing to satisfy themselves that there is no intention on the part of their customers to violate the provision above quoted. The Rubber Control Committee, which has been in general charge of the relations of the American rubber trade with the British government since February 1, 1915, regards this as a matter of the utmost importance, and would ask for an early reply."

TO FACILITATE RE-SHIPMENTS FROM LONDON

The Rubber Club of America, Inc., has sent a circular letter to all rubber manufacturers in this country stating that it has received a number of reports of delays in the export of rubber goods to neutral countries when shipped by way of the United Kingdom, in violation of the provisions of the guarantee entered into by the American manufacturers. The club is therefore in a position to ask every manufacturer to file with it a statement of any such experiences in delayed shipments of goods to neutral countries since February 1, 1915. It is suggested that all this be put together and then

make a collective protest to the British War Trade Department, with the hope that such delays may be avoided in the future or at least reduced to a minimum.

THE RUBBER CLUB YEARBOOK.

The Rubber Club Yearbook, covering its sixteenth year, has just been sent out by the secretary. It is not quite as large a book as the one issued a year ago, as it does not include proceedings of the annual meeting and the reports of the various officers, as was the case in the 1914 book. The present volume is 4 x 9 inches, a convenient size for the desk pigeonhole, and consists of 44 pages with cover. It contains the new charter taken out in the state of Connecticut last March and the revised constitution and by-laws adopted last April. In addition it gives not only a list of the Club's present membership and all its present officers, but lists of all those who have held any office in the past. One noticeable change in the constitution is the elimination of the active member—all members now are either Firm, Associate or Honorary. Another feature which is new to this book is the listing of the officers and members of the Mechanical Rubber Goods Manufacturers' Division and of the Rubber Sundries Manufacturers' Division.

The membership of the Club at the time of issuing this latest report was as follows: Honorary 1 (Sir Henry A. Blake, of England), Firm members 177, Associate members 228, making a total membership of 406, as against 338 a year ago. The firm membership had had an increase of 109 names during the year.

AMERICAN EXPRESS CO. HELPS THE RUBBER CLUB.

Attention was called in the August number of this publication to the fact that, while American rubber manufacturers had lived up very scrupulously to the guarantee they gave the British government not to ship rubber manufactured goods to neutral European countries except by way of English ports, some of their American customers who used rubber manufactured goods in an accessory way had not been so careful. The Control Committee of the Rubber Club had received several complaints from the British consular office in New York that automobiles fully equipped with rubber tires were being shipped to Mediterranean and Scandinavian ports.

These complaints were ascertained to be well founded; and many of these direct shipments had been made through the American Express Co. It was perfectly natural that the express company should forward these goods, as it was in no way a party to the agreements made between the rubber manufacturers and the British government, and it was therefore quite in the ordinary course of business that it should forward automobiles, whether equipped with tires or not, to their destination, provided the steamship companies would accept the shipment.

But when the officers of the Rubber Club brought the matter to the attention of the officers of the express company, explaining the guarantees made by the rubber manufacturers and showing how embarrassing, not to say disastrous, it would be to the rubber trade of the United States if the British government were to re-establish its embargo on crude rubber, the officers of the company, after due consideration, conceded that this was a matter of vital importance to the American rubber trade and voluntarily agreed, by refusing any further shipments of this nature, to assist the Rubber Club in preventing any future violations of the agreement made with Great Britain.

This co-operation of the American Express Co. in this matter will be of very material assistance, for if manufacturers of automobiles, or other articles in which rubber plays an essential part, have a temporary lapse of memory in regard to the guarantees, the refusal of the express company to forward their shipments will act as a very effective reminder.

The Obituary Record.

PROFESSOR THOMAS B. STILLMAN.

THOMAS BLISS STILLMAN, for thirty-five years Professor of Analytical Chemistry at the Stevens Institute of Technology, Hoboken, New Jersey, and an authoritative writer on the chemistry of rubber, died at his home in Jersey City August 10, in his 64th year, after an illness of several weeks.

Professor Stillman retired from his position in Stevens Institute in 1909 and since that time had been city chemist for Jersey City and Bayonne and had also been connected professionally with the city department of Newark. He was very much interested in synthetic chemistry, not only as referring to rubber but to other commodities, and he received a great deal of newspaper attention in 1906, when he gave a "synthetic dinner" at the Hotel Astor—which was described in the press at that time as follows: "He created from various chemicals and under the very eyes of his guests, wines, sauces, salads and other foods in every respect as tempting to the palate as if they had been the products of the vineyard and garden. His guests ate them with wonderment and relish, and none suffered evil effect."

Another episode in his life was equally interesting but rather less fortunate in its denouement. In 1911 a certain inventor announced that he had discovered the secret of making synthetic rubber. He sought to interest capitalists in the enterprise. In order to be on safe ground the capitalists secured the services of Professor Stillman, who was to make a thorough investigation of the matter. He was at first quite skeptical, but as he watched the inventor at his work and finally in the last stage saw particles of a putty-like substance floating on the top of the mixture, which substance when dried had every appearance and characteristic of rubber, he became greatly interested. Following the instructions of the inventor he tried the experiment himself, with equal success, and on the strength of his report a company was formed for the manufacture of this synthetic rubber. But the synthetic rubber was never forthcoming, the result of the enterprise simply being that some of the capitalists' money was transferred to the pockets of the inventor. The whole explanation undoubtedly was that by some process of legerdemain the inventor had introduced into his mixture a certain amount of genuine rubber and thus had deceived the distinguished chemist.

Professor Stillman was a member of many chemical and scientific societies on both sides of the water. He was the author of "Engineering Chemistry," which was first published in 1897 and re-published in various subsequent editions. He contributed extensively to scientific journals.

THREE CHILDREN OF PRES. BRYANT PERISH BY FIRE.

Mary, Lucy and Helen Bryant, nine, seven and six years old, respectively, the three small daughters of George G. Bryant, president of the Racine Rubber Co., of Racine, Wisconsin, lost their lives in the fire which on August 5 destroyed ten summer cottages at Lake Delevan, Wisconsin.

WILLIAM LORD.

William Lord, at one time connected with the Hartford Tire Co., died at the Flower Hospital, New York, August 5, from pneumonia following an operation.

He was born in England 74 years ago and came to this country while still a young boy, settling in Lawrence, Massachusetts. He went to the Civil War as a drummer boy of the Fortieth Massachusetts Volunteers. After the war he associated himself with the Lyall Cotton Mills and occupied the position of general manager for 32 years. He then be-

came chief inspector for the Hartford Tire Co. He invented a number of improvements in the process of rubberizing cloth. He made his home during the last years of his life in New York City.

D. AUSTIN BROWN.

D. Austin Brown, of Boston, for many years New England manager of the Asbestos Packing Co., after the amalgamation of that company with the H. W. Johns-Manville Co., of New York, died August 11 in New Haven, Connecticut, at the home of his daughter. He was also at one time manager of the Bells Asbestos Co. Limited, of London, which operated the mines at Thetford, Canada, later sold to a Philadelphia company. He was born in Boston, of Puritan ancestry, being a direct descendant of Alexander Higginson, the first minister of Salem, Massachusetts, and a member of the Eppes, Hoar, Prescott, Fellows and Trowbridge families of New England. He is survived by three daughters.

JAMES F. MC KEON.

James Francis McKeon, founder of the firm of James F. McKeon & Son, dealers in waste rubber, etc., of 12 Front street, New York, died at his home in Brooklyn on July 17, of Bright's disease. He was born in New York, March 11, 1856, and had been in the waste material business since 1880, first becoming interested in waste rubber in 1902. The present firm was founded in 1910. He was a member of the National Association of Waste Material Dealers. He is survived by his wife, three daughters and two sons, James F., Jr., and Walter E., under whose management the business will be continued.

JOSEPH MOIR.

Joseph Moir, a well-known rubber planter of Johore, died May 27, at Singapore, of malarial fever, at the age of 52 years. He was born in Keith, Scotland, and while still quite young went to Demerara, where he became manager of a large plantation near Georgetown. He had made a thorough study of tropical problems and had held various important commissions, in the execution of which he visited Central and South American countries and Portuguese West Africa. About five years ago he left Georgetown and had since been associated with rubber growing companies in the Straits Settlements. At the time of his death he was on his way home, with his wife, to Aberdeen, Scotland, where he was Commandant of the Aberdeen contingent of the Legion of Frontiersmen.

EMIL RATHENAU.

Emil Rathenau, general manager of the General Electric Co. of Germany, and one of the great industrial leaders of that country, died in Berlin on June 20 at the age of 76 years. Mr. Rathenau was the founder and controlling figure of the largest electrical company of Germany. Thirty years ago he founded The Edison Incandescent Electric Light Co. of Germany, with a capital of 500,000 marks (\$119,000). This company later became the General Electric Co. of Germany.

FILING OF THE WILL OF THE LATE W. M. IVINS

The will of the late William M. Ivins, former president of the General Rubber Co., and a noted lawyer of New York (notice of whose death appeared on page 609 of our August issue) has been filed. By its terms the entire estate is left to his wife, Mrs. Emma Yard Ivins, and in it attention is called to the fact that provision had been made for his children in the form of insurance on his life.

Official India Rubber Statistics for the United States.

IMPORTS OF RUBBER AND MANUFACTURES OF.

	June 1914		June 1915		June 1913		Twelve Months Ending June 1914		Twelve Months Ending June 1915	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Imports of rubber and manufactures of:										
Crude rubber:										
Latex, in primary form:	106,993	\$61,431	148,581	\$55,842	1,318,598	\$766,772	1,533,634	\$793,126	2,472,224	\$963,384
Concentrated latex:	59,910	1,487	299,381	79,005	10,218,191	4,345,088	1,475,804	607,076	5,111,849	1,441,367
Gutta-percha, in primary form:	1,477,881	63,549	1,607,334	77,232	45,345,338	1,174,441	24,926,571	1,155,402	14,851,264	731,995
Gutta-percha, in primary form:	176,985	34,758	4,543	1,013	480,853	167,313	1,846,109	323,367	1,618,214	230,750
India rubber, in primary form:	9,428,700	4,898,062	18,785,812	9,705,718	113,384,359	90,170,316	131,995,742	71,219,851	172,068,428	83,030,269
High rubber, in primary form:	396,809	174,073	1,173,808	74,895	43,385,456	3,709,238	25,958,261	2,063,198	11,006,928	726,914
Total crude rubber:		\$5,144,331		\$9,993,705		\$101,333,168		\$76,162,220		\$87,124,679
Manufactures of:										
Gutta-percha, in primary form:		\$4,174		\$137		\$77,300		\$42,023		\$10,841
India rubber, in primary form:		183,661		52,025		1,217,236		1,517,789		791,281
Total manufactures:		\$187,775		\$52,162		\$1,294,536		\$1,559,812		\$802,122
Statistics, elastic and non-elastic, in primary form:		\$7,424		\$2,517		\$97,452		\$87,642		\$30,349

IMPORTS OF CRUDE RUBBER BY COUNTRIES.

	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Belgium:	365,635	\$33,468			5,917,440	\$5,412,395	10,978,753	\$6,462,760	1,902,370	\$950,872
France:	49,476	20,880	10,531	\$5,087	2,968,232	2,384,677	2,629,287	1,124,629	685,699	284,862
Germany:	477,789	233,054			7,790,742	5,942,371	7,079,260	3,614,510	739,105	358,931
Portugal:	2,118	8,161	554,408	211,155	873,249	642,304	556,560	177,687	4,130,624	1,374,536
United Kingdom:	3,860,538	2,249,110	8,893,562	4,707,279	34,164,908	33,586,808	48,279,674	31,152,336	75,168,236	39,188,519
Central American States and British Honduras:	42,219	27,385	97,940	49,698	989,772	661,001	565,487	297,849	949,865	414,441
Mexico:	46,659	26,447	103,060	37,522	2,033,791	1,335,927	640,448	333,327	1,668,415	650,975
Peru:	2,368,536	880,534	3,770,543	1,895,683	43,518,861	25,905,641	40,641,305	16,319,048	48,753,670	20,738,776
Other South American:	85,991	33,945	232,308	108,372	2,267,050	1,630,608	1,845,422	806,888	4,708,390	2,008,790
East Indies:	1,741,477	975,301	5,109,924	2,684,589	12,255,500	11,888,553	16,597,105	9,675,709	27,898,683	14,051,598
Other countries:	160,831	90,782	13,536	6,450	604,814	580,031	2,182,441	1,255,108	5,463,371	3,007,979
Total:	9,428,700	\$4,898,062	18,785,812	\$9,705,718	113,384,359	\$90,170,316	131,995,742	\$71,219,851	172,068,428	\$83,030,269

EXPORTS OF AMERICAN RUBBER GOODS.

	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Crude rubber, manufactures of:										
Sheet and old, in primary form:	57,459	\$65,342	365,527	\$49,640	7,269,465	\$880,442	6,207,678	\$598,287	2,422,091	\$291,421
Rebanded:	681,004	94,599	613,433	77,291	5,413,247	932,904	5,583,860	834,440	5,970,380	822,561
Belting, hose and packing:		214,155		178,517		2,605,551		2,372,887		1,807,848
Boots and shoes:										
Boots:	14,904	33,709	3,313	9,092	109,528	74,330	101,361	279,206	318,727	726,765
Shoes:	82,006	45,583	99,269	48,071	2,231,467	1,163,953	1,634,258	834,289	2,219,900	2,053,560
Tires:										
For automobiles:		453,178		738,862		3,943,220		3,505,267		4,963,270
For other:		34,787		119,050		611,458		563,377		576,602
All other manufactures:		180,752		480,582		3,913,936		3,453,472		3,525,486
Total:		\$1,129,105		\$1,711,105		\$14,324,894		\$12,441,220		\$14,767,513

EXPORTS OF AUTOMOBILE TIRES BY COUNTRIES.

	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Belgium:						\$401,900		\$15,730		
France:		\$6,586				401,196		13,181		\$6,090
Germany:		12,513		\$365,606		1,125,718		1,503,440		2,655,099
Portugal:		168,276		110,852		1,324,459		961,937		772,574
United Kingdom:				29,760						106,083
Mexico:		2,177		7,117		203,883		111,948		190,813
Other countries:				64,319						245,240
For other:		14,040		8,025		100,476		141,205		250,832
Total:		68,489		135,953		385,588		638,836		736,539
Total:		\$1,129,105		\$738,862		\$2,943,220		\$3,505,267		\$4,963,270

EXPORTS OF FOREIGN MERCHANDISE.

	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
India rubber, manufactures of:										
Sheet and old, in primary form:		\$6,630		3,917		\$77,963		\$23,983		\$127,139
Rebanded:		1,000		1,940		8,766		3,378		29,891
Belting, hose and packing:						163		32,330		9,452
Boots and shoes:		1,700		2,735		1,665		14,319		5,060
Tires:		310,686		39,636		194,457		3,747,549		23,981,559
For other:				873		87,630		24,316		3,483
Total:		\$8,339,918		\$219,787		\$4,622,562		\$2,557,372		\$3,801,749
Manufactures of:										
Gutta-percha, in primary form:		\$404		\$1,983		\$27,906		\$7,638		\$7,489
India rubber, in primary form:						7,973				364
Statistics, elastic and non-elastic, in primary form:						559				

News of the American Rubber Trade.

CANADIAN CONSOLIDATED COMPANY WINS SUIT AGAINST RAILROAD.

A SUIT in a New York court brought by the Canadian Consolidated Rubber Co., Limited, of Montreal, Quebec, against the New York Central railroad, to recover \$69,700 for loss of raw rubber in transit, has been decided in favor of the plaintiff, the court holding that the defendant as a common carrier was liable for the loss unless it could prove that this was the result of fortuitous event or irresistible force, or a defect in the rubber itself, and that the defendant had failed to make such proof. The railroad company had denied both the shortage and the liability.

THE MARKS RECLAIMING PATENT UPHELD IN NEW YORK.

In the suit brought by the Philadelphia Rubber Works Co., of Philadelphia, against the U. S. Rubber Reclaiming Co., Inc., of Buffalo, Judge Hazel, sitting in the United States District Court for the Western District of New York, has decided in favor of the complainant, with costs. The suit was for an injunction and accounting, and alleged infringement of patent No. 635,141, October 17, 1899, to Arthur H. Marks and assigned to the complainant, for a process of reclaiming rubber from vulcanized rubber waste.

Judge Hazel from the evidence presented holds that the patent in suit has the merit of accomplishing a new result by the application of a new process to the reclamation of rubber waste and that as the defendant appropriated the essential features of the process, thereby achieving the same results, he must be held to have unlawfully appropriated the process.

It will be recalled that the opposite view was held by Judge Clarke in the Northern District of Ohio, Eastern Division, wherein he held invalid the same patent in suit, for want of novelty and invention.

RUBBER COMPANY SHARE QUOTATIONS.

The following market quotations of the shares of rubber manufacturing companies on August 25 last are furnished by John Burnham & Co., 31 Nassau street, New York, and 41 South La Salle street, Chicago:

	Bid.	Askd.
American Rubber Co., common	30 1/2	31
American Rubber Co., preferred	110	111
Continental Tire & Rubber Co., common	5 1/2	5 3/4
Continental Tire & Rubber Co., preferred	112	113
The B. F. Goodrich Co., common	61 1/2	62 1/2
The B. F. Goodrich Co., preferred	107	109
The Goodyear Tire & Rubber Co., common	27 1/2	27 3/4
The Goodyear Tire & Rubber Co., preferred	108 1/2	110
Kelly Springfield Tire Co., common	17 1/2	18
Kelly Springfield Tire Co., preferred	88	86
Kelly Springfield Tire Co., 5th preferred	78	78 1/2
Milner Rubber Co., common	140	144
Milner Rubber Co., preferred	107 1/2	108
Portage Rubber Co., common	46	48
Portage Rubber Co., preferred	93	94
Rubber Goods Manufacturing Co., 1st	88	90
Samuelson Tire & Rubber Co., common	51	53
United States Rubber Co., common	104	106

RUBBER COMPANY DIVIDEND

The B. F. Goodrich Co., of Akron, Ohio, has declared a dividend of 1 1/4 per cent. on the preferred capital stock of the company, payable October 1 to stockholders of record on September 20.

VULCANIZED PRODUCTS CO. TO MAKE TIRES.

The Vulcanized Products Co., of Muskegon, Michigan, which in the past has confined its activities to the production of electrical and mechanical goods and tire accessories, is adding a new factory building for the manufacture of automobile tires and tubes. This will probably be ready for operation early in October, will have a capacity of about 200 tires and tubes daily and will provide employment for about 50 operatives.

INTERNATIONAL STAMP MAKERS' CONVENTION.

The International Stamp Manufacturers' Association held its fourth annual meeting July 14-16 at Portland, Oregon, with headquarters at the Multnomah hotel. Owing to illness, the president, Charles Everson, of New York, was unable to be present, and M. L. Willard, of the Superior Rubber Type Co., Chicago, presided in his stead. The meeting was a successful one, both from point of attendance and general interest. Resolutions of regret at the absence of the Association president were adopted and a copy sent to Mr. Everson. New officers were elected for the coming year, the president being E. J. McArdle, of Omaha, Nebraska; treasurer, A. Woodruff, Auburn, New York; vice-presidents, E. M. Tilden, Washington, D. C.; E. T. Rinehart, Los Angeles, California; F. H. Bronner, Portland, Oregon, and B. B. Cairnes, Toronto, Ontario. A proposal that the next convention be held at Chicago met with approval, and a motion to that effect was carried.

RUBBER COMPANIES AFFECTED BY STRIKES.

Among the rubber companies affected by recent strikes among the workers are two in Bridgeport, Connecticut—the Canfield Rubber Co. and the Siemon Hard Rubber Corporation. At the former plant refusal of the workers' demands for shorter hours and increased pay resulted in a strike of about 260 operatives on August 23 and 24. The president of the Siemon Hard Rubber Corporation, Carl F. Siemon, is quoted as stating that the demands of 200 employees on strike for abolition of piece work and substitution of a flat wage scale at the plant of that company will not be granted.

FIRES AND EXPLOSIONS.

A fire of mysterious origin occurred at the plant of the National Conduit & Cable Co., at Hastings, New York, August 17, but was extinguished with damage amounting to only a few hundred dollars. This company employs about 3,000 men and has been of late turning out large orders for shipment to the allied and neutral European countries.

At the Turtle Creek plant of the Westinghouse Electric Co., which has been running to capacity on army orders, an explosion on August 13—following the receipt by a Pittsburgh paper of a letter stating that the plant was to be blown up—killed two men and injured 6 others, in addition to the damage done to the plant.

ASBESTOS PRODUCTION.

The asbestos production of the United States in 1914 showed an increase of 13 per cent. over that of the previous year, reaching 1,247 short tons, valued at \$18,565. This is a 72 per cent. increase in value as compared with the 1913 production, one of the most notable features of the industry being the development of a new field in Arizona which produces a higher grade of asbestos than any hitherto found in this country.

A company is being organized in Oakland, California, with L. V. Stevens, a mining engineer, at its head, to operate an asbestos plant in that city. This organization is said to be the result of a discovery of asbestos in Trinity county, in the northern part of the state.

Valuable deposits of asbestos of good quality have recently been found in western China, near the city of Pachow.

Should be on every rubber man's desk—Crude Rubber and Compounding Ingredients; Rubber Country of the Amazon; Rubber Trade Directory of the World.

MECHANICAL RUBBER CO. OF CLEVELAND.

During the past three years the extensive plant of the Mechanical Rubber Co., of Cleveland, has been effectually modernized under the factory management of A. T. Hopkins. Re-arrangement of the power plant and new installations have resulted in a notable saving. The druggists' sundry and specialty lines of the United States Rubber Co. are concentrated at this factory, where there exists specifications for a practically unlimited list of specialties, in addition to the usual standard variety of mechanicals. The factory management wisely fosters consideration of the human element and finds great satisfaction in the generous response made to every effort in that direction. They have an emergency room, in charge of a trained nurse; a branch of the Cleveland Public Library and several tennis courts for the use of the employees; while here and there window boxes of bright flowers add a pleasant touch of color to a remarkably orderly and attractive factory arrangement.

THE HEWETT PLANT AT BUFFALO.

The Hewett Rubber Co., of Buffalo, New York, is rapidly installing additional mills and calenders in its elaborate new factory extension. The entire plant is a model in fireproof construction and arrangement.

The plan and equipment of the plant mark a radical departure in rubber mill construction. Spaciousness and ample daylight illumination are a special feature of the Hewett factory. Each mill and calender is operated, by its independent motor, by Niagara electric power.

A 1,000 horse-power steam plant for heating and vulcanizing occupies an elevated position, and above it are suspended steel coal pockets holding 500 tons of fuel, descending by gravity and fed to the furnaces by mechanical stokers. The office building contains a series of laboratories for physical and chemical testing which are equipped with every facility in the matter of apparatus and supplies.

BAKELITE PATENTS DECLARED VALID.

Judge Thomas I. Chatfield, in the United States District Court, Eastern District of New York, on June 12, 1915, rendered decision that three patents of the General Bakelite Co. are valid and have been infringed by the George J. Nicholas Co., of Chicago.

FORD MOTOR CO. TO MANUFACTURE TIRES.

It is currently reported, through authentic sources, that the Ford Motor Co. is experimentally studying the subject of tire construction. Ultimately a tire plant with an annual capacity for 2,000,000 tires, will be part of the new manufacturing center to be built by the Ford company. The site is at Oakwood, West Detroit. Mr. Ford is quoted as having said: "Within fifteen months the automobile tractor plant will be well under way. The five-dollar-per-day scale of wages now operating so successfully at our Highland Park factory will be extended to those working in the new West Detroit plants."

THE NATIONAL RUBBER CO. MOVING TO WILLIAMSBURG.

The National Rubber Co., now operating a factory at Pottstown, Pennsylvania, has commenced work on a new plant at Williamsburg, in the same state, a ten-acre tract having recently been purchased for this purpose. A railway siding to the property, with abundant water supply and free power, are special features of the new location. Present plans provide for a main building 65 x 1,000 feet, with a power house 40 x 40 feet, a machine shop 65 x 120 feet, and an office building 50 x 50 feet, all one story high. As soon as building operations are completed the machinery in the Pottstown plant will be moved to Williamsburg, and considerable additional new machinery will also be required. In the new plant there will be no overhead belting or shafting, all the machinery being independently driven by electricity.

TRADE NEWS NOTES.

The Victor Rubber Co., of Springfield, Ohio, is erecting a second two-story building, 30 x 108 feet, practically duplicating a newly completed addition to its plant.

The Toledo-Ford Tire Co. plans to construct a new addition to its plant at Findlay, Ohio. It will be 50 x 130 feet and four or more stories high.

The Subers Fabric & Rubber Co., of Cleveland, Ohio, of which L. A. Subers is president and general manager, is affiliated by license agreement with The Goodyear Tire & Rubber Co., to manufacture under the Subers patents in the United States, Canada and Mexico. For the past year air brake hose, made with Subers fabric has been used with marked success on several important trunk lines in the East.

The Yoerg Tire & Rubber Co. has had plans prepared for an \$18,000 service station on Chestnut street, Holyoke, Massachusetts.

An offer made by the new McClurg Rubber Co. for the property of the S. & M. Tire & Rubber Co. at Coshocton, Ohio, has been accepted and approved by the court, and an order issued to the receiver to sell this property. Appraisers have fixed its value at \$66,171.25.

The new plant of the Endurance Tire & Rubber Co. at New Brunswick, New Jersey, is now ready for occupancy. This company has been working, in its old plant, full force and to the limit of capacity for some time past.

The Standard Four Tire Co. is erecting a plant at Keokuk, Iowa, to be equipped for the manufacture of tires, which it expects to have ready for operation about the first of December. W. J. Richards will be superintendent of the new plant. The officers of the company are: President, C. R. Joy; vice-president, C. F. McFarland; secretary, A. L. Higbee; treasurer, A. E. French.

A practical test recently made by The Goodyear Tire & Rubber Co., of Akron, Ohio, demonstrated that rapid driving and exposure of tires to the sun on a hot day, increased the air pressure four pounds over the initial pressure of 80 pounds. This increase is insignificant as regards possible injury to the tires. Under inflation, not over inflation, is the condition to guard against.

In pursuance of its plan for extension, mentioned on page 504 of our June issue, the Fisk Rubber Co. has awarded a contract for the erection of a large modern brick and steel plant at Oak and Grove streets, Chicopee Falls, Massachusetts; this addition to cost \$300,000.

The Mishawaka Woolen Manufacturing Co., of Mishawaka, Indiana, has revised its plan for an additional factory building for the manufacture of rubber footwear, increasing the size to 100 x 235 feet, four stories high.

The Boston Woven Hose & Rubber Co., of Boston, whose fiscal year ends August 31, is reported to have made a new record for gross sales during the late spring and early summer months, and is expected to show a handsome net profit on the year's business.

The Electric Hose & Rubber Co., of Wilmington, Delaware, is planning the erection of a new warehouse in that city. The building contemplated is 248 x 31 feet, one story, of brick and concrete.

On January 1 next automobiles will replace the motorcycles in use on 8,000 rural mail routes throughout the United States. A system is also being put into effect by which city delivery by automobile is to be extended as rapidly as possible from all large cities of the country to points within a radius of 25 miles. This will mean a considerable increase in the government's tire purchases within the next year or so.

SCHRAEDER ADDITIONS AND IMPROVEMENTS.

A contract has been awarded for the construction of a seven-story addition, 100 x 160 feet in area, to the factory of A. Schrader's Son, Inc., of Brooklyn, New York.

This firm, whose recent improvements in tire valves have been noted in these columns, has introduced among the accessory dealers a new container for the washers used inside these valves. This container is damp proof and dust-proof and is grooved so that each washer is kept separate from the others.

TRADE NEWS NOTES.

The Akron Tire Co., Philadelphia, which deals in Akron-made tires, has brought suit against the Akron Tire Co. of New York, to restrain the latter company from operating in the state of Pennsylvania under its present name. A preliminary injunction has been granted, pending hearing of the suit.

The Aniline Products Corporation has been organized at St. Louis, Missouri, with a capital stock of \$12,000, to manufacture chemicals. The incorporators are Clinton E. Udell, John J. Morse, J. D. Johnson and Oliver Frazier.

A new law is being enforced at Cleveland, Ohio, regulating the weight of motor trucks, which, for vehicles having tires less than three inches wide, operating on stone, brick or macadamized roads, must not exceed 3,400 pounds. Permission to operate vehicles of greater total weight over country roads must be obtained from the Board of County Commissioners. A prohibition is placed on vehicles or contrivances having flanges or lugs.

The Standards Committee of the Society of Automobile Engineers will hold an interim meeting at Chicago on October 15.

The National Association of Automobile Accessory Jobbers, which recently met at Chicago for its mid-summer session, will hold a meeting at Excelsior Springs, Missouri, October 20-22.

The Giant Tire & Rubber Co., of Omaha, Nebraska, is soon to open a sales branch at Dallas, Texas.

The United States Rubber Co. is making the fabric for the balloon now being built by the Connecticut Airship Co., of New Haven, Connecticut—the first of the proposed fleet of dirigibles—for the United States government.

The complete line of electric wires, cables and cable accessories exhibited by The Standard Underground Cable Co., of Pittsburgh, at the Panama-Pacific International Exposition at San Francisco, has won for that company a gold medal, the highest award in its class.

The Dreadnaught Inner Tube Armor Co., recently incorporated at Toledo, Ohio, is looking for a site for a factory in which to manufacture tires and a patented inner tube claimed to be puncture-proof.

The Washington Tire & Rubber Co. has purchased a plant at Washington, Pennsylvania, for tire manufacturing purposes. It is expected that work will commence by December 1, with about 150 employees. The plant will be in charge of C. J. Davis, of East Palestine, Ohio.

All the real estate, machinery and stock of the Quality Cement Co., manufacturers of rubber cement at Fernwood, Pennsylvania, near Philadelphia, will be put up for sale on the morning of Friday, September 3.

Among the concerns conspicuous for rapid and remarkable development is the McGraw Tire & Rubber Co., East Palestine, Ohio. This company has recently increased its pneumatic tire production 75 per cent., and is making appreciable progress in its solid tire department. It expects soon to erect a new administration building.

The manufacture of a fountain pen requires 210 distinct opera-

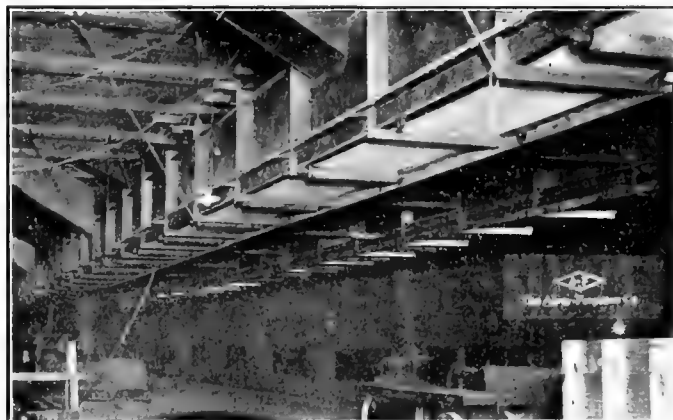
tions. In the "Ideal" line, made by the L. E. Waterman Co., there are almost 15,000 different kinds of pens, differing in size, in style and finish and in character of point.

In the litigation between the L. E. Waterman Co. and the Modern Pen Co. regarding the use of the name "Waterman" in connection with the sale of fountain pens, the New York Supreme Court has recently confirmed a former decision authorizing the Modern Pen Co. to continue the use of the name, and has granted an injunction restraining the L. E. Waterman Co. from circulating copies of an injunction obtained by it and from bringing a multiplicity of actions against customers of the Modern company.

The B & R Rubber Co., North Brook field, Massachusetts, has the distinction of producing in its unique "Armortred" gray rubber sole that is lighter than leather or any other known rubber sole manufactured. It weighs, size for size, from 25 to 50 per cent. less than the average rubber sole in use. The makers state that repeated service tests have demonstrated that these soles easily outwear leather. "Armortred" and other B & R quality and competitive stocks were specially designed by their chemist, Webster Norris.

UNITED STATES MAIL CARRIED ON RUBBER BELTS.

A system of mechanical conveyors recently installed in the new Post Office at Forty-fifth street and Lexington avenue, New York City, is said to be the most extensive and complete of its kind in the world. Sacks of mail brought by vans or mail cars are taken into the building and delivered to the various depart-



CONVEYOR BELTS IN NEW YORK POST OFFICE.

ments for sorting by conveyor belts. When sorted, the mail is replaced in the sacks, which are then delivered to the waiting vans or mail train by carrier belts—in fact, the sacks are not handled while in the building except by the sorters.

The mechanical carriers which perform this novel service consist of bucket lifts and moving rubber belts. One is a 5-ply belt, 30 inches wide and 500 feet long. Another is 6-ply, 30 inches wide and 800 feet long, and the largest is 6-ply, 30 inches wide and 850 feet long.

The conveying machinery was constructed and installed by the Alvey-Ferguson Co., and the rubber belts furnished by the Cincinnati Rubber Manufacturing Co., both of Cincinnati, Ohio.

THE TRAILER INCREASES TRUCK EFFICIENCY AT SMALL COST.

The increase in efficiency of a rubber-tired motor truck equipped with a trailer has been figured by experts to be 453 per cent., at a 6 per cent. increase in cost. In Detroit, the home of automobile manufacture, many motor trucks thus equipped are in use, and figures from that city show that a five-ton truck with trailer has a load average of 10 tons, in all kinds of weather, and has hauled as much as 14 tons. The trailer idea involves the principle that less motive power is required to drag than to carry a load.

PAUL W. LITCHFIELD.

PAUL W. LITCHFIELD, factory manager of The Goodyear Tire & Rubber Co., Akron, is of New England extraction, having been born in 1875 and raised in that famous center of culture, Boston. Mr. Litchfield's education was received in

the Boston public schools. On graduation from the English High School of that city, he entered Massachusetts Institute of Technology, graduating four years later with the degree of Bachelor of Science in Chemical Engineering.

His first attempt to put his knowledge to practical use was in the work of surveying for the Massachusetts Metropolitan Park Commission. After six months of this he entered the employ of L. C. Chase & Co., of Boston, manufacturers of tires and carriage cloth; which was his introduction to the



P. W. LITCHFIELD.

rubber industry. The next step in his acquaintance with the commercial possibilities of rubber came with a transfer to the New York Belting & Packing Co., of Passaic, New Jersey, where he became foreman of the molded goods and packing departments. From here it was but a step to the superintendent's chair of the International Automobile & Vehicle Tire Co., which later became The Michelin Tire Co., and from there to his present position of factory manager of the Goodyear company.

When Mr. Litchfield first became associated with the Goodyear company—on July 15, 1900—the tire industry was still in its infancy. The company itself was less than a year old and employed but 176 men.

When the manager of an immense factory attributes his fifteen years' success to the workmen who have stood by him, one catches in an instant the secret of his control. Belief in men is the key to co-operation. Mr. Litchfield, upon the occasion of a banquet, tendered him recently to celebrate his fifteenth anniversary in charge of the Goodyear factory, electrified the workers present when he announced, in appreciation of the support which the factory organization had given him during these years, the gift of \$100,000 in the name of himself and Mrs. Litchfield, as a fund to be used for the benefit of factory employees, and to promote efficiency, team-work and loyalty in the organization.

"These are the essentials to success," said Mr. Litchfield. Urging team-work, he pointed out what it means when an organization works harmoniously. Alone, his efforts would have been largely in vain, but Goodyear co-operation and loyalty had succeeded in increasing the factory fifty-fold.

Mr. Litchfield's letter to the trustees selected by the employees to hold the fund in trust, accompanying his check for \$100,000, stipulated that the principal sum should be kept intact for five years, and that at least \$50,000 be kept intact for ten years. This means no expenditure.

The following is taken from his letter:

"I have been thinking of the idea of sharing with my co-

workers a part of the savings which I feel they have shared in producing. Its continued existence in considerable amount should tend to unite Goodyear workers, and give them a sense of responsibility, educating them in business methods, promoting thrift and saving, developing loyalty, efficiency, and co-operation, and cause them to feel that they have something saved up for their use in order to tide them over the emergency of a 'rainy day.' The income may well be used for such things as are not the logical function of The Goodyear Tire & Rubber Co., or other organizations for employees now in existence."

MR. BUSSWEILER BECOMES MR. BOSWELL.

Alfred B. Bussweiler, who has been connected with the rubber trade in London for the last 30 years, and who has long been a loyal and enthusiastic Britisher, has changed his name to Boswell; which is certainly a good old English name with a fine literary flavor. Mr. Boswell is a nephew of the late Max Hecht and founder of the firm of Hecht, Levis & Kahn of London and Liverpool. He first became connected with the rubber trade as a clerk with the Liverpool house of his uncle's firm. In 1892, he entered into partnership with William Symington, who was at that time a rubber broker in Liverpool. In 1895, he became a partner in the Liverpool house of Symington, Bussweiler & Co., and the London house of Alden, Symington & Co. About 1902 he joined Arthur Meyer in forming the London firm of Meyer & Bussweiler, and after a few years this firm was dissolved and Mr. Bussweiler became one of the rubber brokers "in the Lane." A few years ago he joined the old established Mincing Lane brokerage firm of Thompson, where he is at present.

MR. FREDERICO POND REVISITS AMERICA.

After an absence of 39 years, Frederico Pond, lately of Pará, but now of Rio de Janeiro, is revisiting his native country. He arrived early in the summer and expects to remain in the United States until October. There are few men in the rubber trade whose experience compares with Mr. Pond's in extent and variety. He left Salem, Massachusetts, his native city, in 1860, when he was a boy of 18, and went to Pará to become identified with the rubber industry of the Amazon. Barring an occasional visit to this country, the last in 1876, and a good many trips to Europe, he has been in Pará ever since. Foreseeing the crisis which menaced the rubber trade of the Amazon, he retired from business a short time ago and transferred his residence to Rio, a city which he pronounces one of the most delightful in the world.

Notwithstanding his fairly mature years—which may be inferred from the statistics above—Mr. Pond is full of vitality and animation and, it may be added, as full of rubber information as an encyclopedia. Incidentally, when asked if South America was a promising country for young Americans to strike out for, he replied that while many young Americans had done well there his advice to them would be to stay at home, as no land in the world offered the opportunities to young men of energy and capacity that are to be found right here in the United States.

A FAMOUS RUBBER BASEBALL TEAM.

The baseball team of the B & R Rubber Co., of North Brookfield, Massachusetts, seems to be a star team. Last season it played fourteen games and won thirteen; this year so far it has played twelve games and won nine. The team plays practically every Saturday afternoon and on holidays, and these exhibitions of high-class baseball are highly appreciated by the citizens of North Brookfield. For the purpose of raising funds, the Baseball Association gave a cabaret entertainment in the town hall July 30. An interesting program of songs and instrumental music was rendered by local talent, chiefly employees of the B & R company.

INTRODUCING HARRY M. HOPE.

NOT that he needs introduction to many of the American rubber manufacturers, but more particularly to use a catchy caption; and this is really the important part, to say a word about rubber mill engineers in general and Mr. Hope in particular.

Time was when chemists were unknown in rubber mills. Today there are as many chemists as superintendents, probably more. History is repeating itself in respect to rubber mill engineers. The field is there and it is being rapidly filled, and to the special advantage of the rubber trade. The important field for the engineer is embraced in the economic and engineering features of the generation, distribution and application of power. Frequently great savings can be made in the use of fuel by comparatively inexpensive changes in the boiler plant and the method of firing, based on an accurate analysis of existing conditions. Even greater economies can often be obtained by the application of power to manufacturing equipment in such a manner as to permit the most efficient use of labor and the rapid conversion of raw material into the finished product. All of this calls for special training. That Mr. Hope outside of his rubber mill work has this in abundance is proved by the following brief outline of his activity in the engineering field:

He was born April 13, 1879, at Niles, Michigan, and attended the excellent public schools of Muskegon, Michigan, Northwestern University and Lewis Institute of Technology, Chicago.

His early engineering experience was acquired with the Muskegon Lighting and Traction Co., of Muskegon, Michigan. He entered the employ of the Chicago Edison Co.'s testing laboratory in 1902, and spent one year making power plant tests and reports on manufacturing establishments and the power plants of the company.

In 1903 he was transferred to the engineering department of the Chicago Edison Co., working as an engineer in connection with the design of power stations and electrical transmission and distributing system of the company. In 1904 he was appointed electrical engineer of the North Shore Electric Co., in charge of the design of power stations, sub-stations and electrical transmission and distributing lines, and acted in an advisory capacity in relation to the construction and operation of the entire power, generating and distributing system.

In 1907 he became associated with the engineering department of the Stone & Webster Engineering Corporation, in Boston, and for three years acted as engineer in charge of the design of power plants and electrical transmission and distributing systems. Here he made many investigations and reports relating to the power systems of public utilities and industrial properties. In 1911 he was placed in charge of the engineering department, as assistant to Frederic N. Bushnell, vice-president. He continued in this capacity until March, 1915, when he resigned to establish his own organization of power experts.



HARRY M. HOPE.

PERSONAL MENTION.

Edward B. Aldrich has resigned as vice-president and treasurer of the Intercontinental Rubber Co. and as officer of their allied companies.

D. S. Miller, who for the past four years has been connected with the sales force of the Diamond Rubber Co., in the New Orleans district, has severed his connection with that company and announces his intention of taking a much needed rest, for the present.

Arthur Jones, a director in the rubber brokerage firm of William Symington & Co., of London, England, arrived recently in New York from the Far East en route to London.

Miguel P. Shelley, formerly connected with J. Marques, one of the leading exporters of Amazon products, of Para, Brazil, has recently arrived in New York. He is an expert in South American trade, as he was connected with it, in various ways, chiefly at the port of Para for 25 years. He is particularly familiar with South American rubber producing. Mr. Shelley expects to remain in New York and connect himself with the South American export and import trade.

E. J. Kane, of 59 Ann street, New York, has been connected with the rubber business, in rather a unique way, for a great many years. He deals exclusively in second-hand articles. He carries a great variety of hose in stock and makes a specialty of fire department hose of every sort. His stock consists entirely of articles that have been used but which have been used so little as to entitle them to further service rather than to reclamation to the reclaiming works.

A RUBBER ADVERTISING MAN WINS A HANDSOME PRIZE.

A year ago last spring an association of 40 American manufacturers offered cash prizes aggregating \$3,000 for the best ideas submitted which would help them in any department of their work, either manufacturing, selling or advertising. The contest, which was open for a year, closed last May. The awards have been made, and the second prize, amounting to \$500, has been given to R. W. Ashcroft, the advertising manager of the Canadian Consolidated Rubber Co., Limited, of Montreal.

THE INVENTOR AND THE PNEUMATIC TIRE.

In commenting recently on the number of letters received daily containing suggestions for the improvement of the pneumatic tire, L. C. Rockhill, manager of the automobile tire department of The Goodyear Tire & Rubber Co., of Akron, states that the prospects are excellent that the present pneumatic tire that we know will remain for an indefinite period superior to the schemes for improving it. He states that the company is able to use about one in every 200 suggestions offered, 90 per cent. of which aim to render the tire puncture proof, usually by means of a metal tread or a metal strip set in the tire. He adds:

"As a matter of fact, puncture-proof qualities, in comparison with other qualities which are imperative, are a minor point in tire construction and are usually obtained by sacrificing some other desirable quality. Our investigations show that on a basis of 100 per cent. for direct wear on a tire, 11 per cent. will represent expense caused by punctures."

SUBSTITUTE FOR EBONITE.

PLASTIC COMPOSITIONS.—W. Plinatus, British patent No. 12,142 (1913). A product resembling horn, ivory or ebonite is made by mixing albumens, such as serum, egg or casein, with an ester of a polyvalent alcohol of the fatty acid series, such as the acetins or other esters of glycerin or polyglycerin. Other substances, such as fats and oils, or sulphuretted oils, resins, pitches, paraffins, camphor, cellulose derivatives, or caoutchouc may be added in dissolved state or otherwise. The mixture may be treated with hardening substances, such as aldehyde, tanning substances or chromium compounds, and coagulable albumens may be hardened by chemical or steam treatment. Filling and coloring substances may be added.

NEW INCORPORATIONS.

Ackerman, Son & Co., Limited, B. F., July 7, 1915; under the laws of Canada; authorized capital, \$500,000. Incorporators: Benjamin Franklin Ackerman, William Clair Ackerman, Edward Whitla Borbridge, George Robertson and Jennie Edna Waddell, of Peterborough, Ontario. Location of principal office, Peterborough. To manufacture rubber goods, etc.

Athol Manufacturing Co., July 14, 1915; under the laws of Massachusetts; authorized capital, \$200,000. Incorporators: William P. Everts, A. S. Laskey and Edward T. Roche—all of Boston. Location of principal office, Athol, Massachusetts. To manufacture and deal in rubber and rubber goods of all kinds, and machinery, tools, equipment and appliances for the making of rubber goods.

Bell Rubber Co., Inc., August 7, 1915; under the laws of New York; authorized capital, \$20,000. Incorporators: William O. Geisman, Anna Geisman and Sarah F. Schroeder—all of 897 Bedford avenue, Brooklyn, New York. To manufacture rubber goods, tires, etc.

Burgamy Tire Co., The, July 22, 1915; under the laws of Ohio; authorized capital, \$15,000. Incorporators: Philip Renner, Walter G. Stiles, J. R. Burgamy, Julia Burgamy and Arthur Wood. To deal in automobile tires and accessories, especially McNaull and Nassau tires.

Dupont Rubber Co., Inc., August 2, 1915; under the laws of New York; authorized capital, \$25,000. Incorporators: Harry A. Baggot, 504 West One Hundred and Thirty-ninth street, New York City, and Mary L. and William L. Schatz, 217 Fifth avenue, Long Island City, New York.

Hart Sales Co., Inc., August 19, 1915; under the laws of New York; authorized capital, \$10,000. Incorporators: John G. Hart, Ocean Parkway and Avenue N, Brooklyn, New York; J. Lawrence Bradlee, North Long Branch, New Jersey, and Laura Barry-Smith, 103 Park avenue, New York City. Rubber clothing.

Los Angeles Rubber Stamp Co., June 14, 1915; under the laws of California; authorized capital, \$100,000, divided into one thousand shares of the par value \$100 each. Incorporators: G. W. Randall, F. T. Rinehart, G. E. Rinehart, J. W. Rapley and H. A. Osgood—all of Los Angeles, California.

Murray Spring Tire Co., The, July 20, 1915; under the laws of Ohio; authorized capital, \$50,000. Incorporators: H. W. Sisson, F. M. Ossman, John F. Wilson, M. M. Feidner and J. G. Fogg. To manufacture tires and wheels for automobiles.

Narrangansett Rubber Co., July 30, 1915; under the laws of Rhode Island; authorized capital, \$50,000, divided into shares of the par value of \$100 each. Incorporators: Terrence McCarty, James P. Murphy and Florence F. Sullivan—all of Bristol, Rhode Island. To manufacture, sell, import, export and generally deal in and with rubber, rubber compounds, substitutes for and improvement of rubber, etc.

Perfection Tire Sales Co., The, August 9, 1915; under the laws of Delaware; authorized capital, \$1,000,000. Incorporators: F. J. Handel, L. B. Bautz and M. W. Bennett—all of Buffalo, New York. To buy, sell and deal in automobiles, automobile tires, rubber goods and all accessories thereto. Location of principal office is with the Colonial Charter Co., 927-929 Market street, Wilmington, Delaware.

Reliable Waterproof Raincoat Co., August 16, 1915; under the laws of New York; authorized capital, \$1,000. Incorporators: Sam Wohl, 100 Avenue C; Sam Mandlowitz, 726 East Sixth street, and David Schneider, 115 Avenue C New York City. Raincoats.

Schau Airless Tire Co., The, July 3, 1915; under the laws of Michigan; authorized capital, \$60,000. Incorporators: Phillip Schau, George W. Morgan and Newman Sanford—all of Kalamazoo, Michigan. Location of principal office, Kalamazoo. To manufacture and sell at wholesale and retail a patented auto-

mobile tire, and to manufacture and sell automobile parts and supplies.

Silber & Son, Inc., A. L., August 19, 1915; under the laws of New York; authorized capital, \$25,000. Incorporators: Abraham Silber, Isaac Silber and Dora Silber—all of 538 East One Hundred and Thirty-eighth street, New York City. Rubber business.

TRADE NEWS NOTES.

The Philadelphia Rubber Works Co. has removed its New York offices from the Vanderbilt Avenue Building to 1702 Vanderbilt Concourse Offices, at Vanderbilt avenue and Forty-fifth street.

Johnson & Johnson, manufacturers of rubber specialties, etc., for the drug trade, are adding a new building 200 x 500 feet in area, to their already extensive plant at New Brunswick, New Jersey.

The Sussex Rubber Co., of Rutherford, New Jersey, announces that H. A. Middleton and William M. Sharpe are no longer connected with the business of that company.

At the annual meeting of the Continental Rubber Works, held at the company's offices at Erie, Pennsylvania, August 2, the directors and officers of the past year were re-elected. These are: T. R. Palmer (president and general manager); Alexander Jarecki (vice-president); Charles Jarecki (secretary); O. E. Becker, Jacob Roth, James N. Thayer and Fred C., R. K. and Robert Jarecki. Charles S. Coleman is treasurer of the company.

The Gryphon Rubber & Tire Corporation, mentioned on page 622 of our August issue as having been incorporated July 9 with a capital stock of \$6,000, we are advised by T. McGiehan, its president, has a capitalization of \$600,000. He states that the company, which has offices at 52 Vanderbilt avenue, New York, has purchased land at Bailey avenue and One Hundred and Ninety-second street, on the Harlem river, valued at \$30,000, and that contracts have been let for a tire factory, specially designed, wholly of glass and steel, that will turn out over 250 tires a day, and which will cost approximately \$30,000.

S. Schein & Sons have purchased a two-story brick factory building, about 119 x 200 feet, at 605-613 Third street, Newark, New Jersey, for the manufacture of a line of hospital rubber goods and druggists' sundries.

On the petition of Lucy H. Stotesbury and William H. Jessup, executors of the estate of the late James M. Stotesbury, a receiver has been appointed for the S. & L. Rubber Co., of Chester, Pennsylvania.

Employees of the Victor Rubber Co., of Springfield, Ohio, held their annual picnic on August 7, at Tecumseh Park, near that city. This was an all-day event, the party leaving the city at 8:25 and returning late in the evening. Amusements and games of all kinds were indulged in, a dinner was served to the employees and their guests, and in addition to the regular band a special orchestra supplied music for the dancers.

In the letter from our Akron correspondent on page 619 of our August issue, the statement was made that the court had dismissed, on a technicality, a petition filed by a stockholder of the East Palestine Rubber Co., of East Palestine, Ohio, that that company be placed in the hands of a receiver. We are informed by the treasurer of the East Palestine company, Mr. B. C. Tunison, that the proceeding was not dismissed on a technicality, but that the plaintiff when forced to a hearing voluntarily withdrew his petition.

Fred L. Summerhayes, of the Canadian Consolidated Rubber Co., Limited, who has been visiting in the Canadian provinces, returned recently to England, in company with J. H. Jamieson, former manager of one of the company's branches. An "Over-seas" division is to be established in Great Britain, comprising branches at London and at Glasgow, Scotland.

THE NEW HODGMAN OFFICE BUILDING.

THE village of Tuckahoe is only three miles north of the New York City line and 16 miles from the Grand Central station on the line of the New York Central road and can be reached from that station in half an hour. It is a very pretty spot, among the hills of Westchester County. The factory of the Hodgman Rubber Co. has been located there for 64 years, and the company recently decided, in order to get more room, light, air and better accommodations generally, to move its show rooms and general offices to Tuckahoe, and to put up a special building for that purpose. The work on this building has been under way for some months. The exterior is now practically completed, as will be seen from the accompanying illustration. The interior will be finished within the next two or three months, and the company expects to move its office force from its present location at 806 Broadway, New York City, to this new building in Tuckahoe by the first of January next.

The building is three stories in height, with basement, and stands some distance back from the road. The main portion of the structure has a frontage of 150 feet and a depth of 125 feet. The basement and first floor are to be used for storage and shipping purposes. The goods are taken in at the side and rear, at which points there are covered loading platforms. Adjoining the main entrance on the first floor are reception and waiting rooms, which have a main staircase leading directly to the officers' quarters on the second floor.

A portion of the second floor is to be occupied by the officers of the company and is divided into various rooms for this purpose. The remaining portion of this floor is to be used for the sales and accounting departments. The front portion of the third floor is to be used entirely for offices and the rear is divided into spacious dining rooms for officers and employees, with adjoining kitchen, pantry and store rooms. Comfortable "first aid" rooms with adjoining bedrooms and bath are also provided to take care of any unforeseen illness of employees.

The exterior of the building is made up of a combination of terra cotta, brick, faience tile and concrete, so distributed as to give a very pleasing effect. The main pilasters are of reinforced concrete lined with red brick which extends across the openings and connects with ornamental brick panels under the windows. Terra cotta is used to form the central feature of the front facade extending entirely around the main entrance to the building.

The building is of fireproof construction throughout, and designed along the most modern engineering lines. The frame is entirely of reinforced concrete, including all floors, columns and staircases. All the latest fire protection devices are provided, including automatic sprinklers and stand pipes on all floors. The mechanical equipment throughout is modern in every particular.

It is the company's purpose to maintain a sales office and show rooms in New York City for the convenience of the trade. This office will be connected by direct wire with the main office and the facilities for handling orders will be most complete.

TRADE NEWS NOTES.

At the annual meeting of stockholders of the Tireless Rubber Co., which was held at the company's general offices at Ashland, Ohio, July, 30, the former officers and directors were re-elected. These are: F. W. Miller, president and treasurer, P. A. Myers, vice president, J. L. Miller, secretary, C. E. Campbell, general manager, and E. E. Myers.

The New Castle Rubber Co., of New Castle, Pennsylvania, has increased its output from an initial product of 100 tires a day to 300, and reports that its "New Castle" and "Lehigh"

tires are successfully competing in the markets of Pennsylvania and New York, where they have been entered.

A petition in bankruptcy has been filed against the Franco American Rubber Cloth Co., Inc., of 34 East Tenth street, New York. The liabilities of the company, which manufactured raincoats, are given at \$5,000, and the assets at \$500.



NEW OFFICE BUILDING OF THE HODGMAN RUBBER CO.

The Charles A. McInt Co., of Campbell, Massachusetts, is said to be negotiating with representatives of the Italian government for a large supply of rubber raincoats for the Italian army, and to have submitted samples of a special design having a long skirt and a hood that fits over the army cap.

The Rubber Division of the National Association of Wholesale Dealers held a regular meeting on August 20 at Atlantic City, at which various important matters were considered.

The Dunlop Tire & Rubber Co. plans the erection in the near future of a \$30,000 three-story addition to its factory at Toronto, Ontario.

A new steamship line, of which the Moore, McCormick Co., Inc., is the agent, is to be established between New York and South America. The first sailing will be on September 1, when the steamer "Montara," of about 3,000 tons, will sail from New York for Rio de Janeiro, calling at Pernambuco, Maceio and Bahia.

A committee has been appointed by Secretary of the Treasury McAdoo to arrange a return visit to the South American republics by representatives of the financial, industrial and commercial interests of the United States.

The Goodyear Tire & Rubber Co. about the middle of August completed its withdrawal from the retail field in New York City, discontinuing its store at 1972 Broadway. The company now has in New York, besides its district headquarters and export department at Long Island City, a service station and truck tire department at 207 West Fiftieth street and a mechanical goods department at 30 Church street.

PROPOSED GOVERNMENT PURCHASES.

The Bureau of Supplies and Accounts, Washington, is inviting bids on Navy Department supplies as follows:

- September 7, 1-inch suction hose, schedule No. 8682.
 7, rubber insulating tape, schedule No. 8672.
 14, unlined linen fire hose, underwriters' standard, schedule No. 8639.
 14, suction hose, schedule No. 8722.
 14, unlined linen hose, schedule No. 8711.

RUBBER TRADE INQUIRIES.

[112.] A European dealer in surgical rubber goods and druggists' sundries inquires for names of manufacturers in a position to supply red rubber sponges, gloves, nipples, etc.

[113.] Inquiry has been received from abroad for addresses of manufacturers of forcing machines for bicycle tubes and gas hose, also molds for bicycle tires.

[114.] Another inquiry is for machinery for the manufacture of hard rubber combs.

[115.] A firm manufacturing rubber goods desires to know where it can obtain supplies of red aristi.

[116.] A European manufacturer of rubber hose is in the market for hose duck, samples of the qualities desired having been sent this office, where they may be inspected.

TRADE OPPORTUNITIES FROM CONSULAR REPORTS.

A druggist in Canada desires information relative to rubber combs. Report No. 17,388.

A firm in Argentina desires quotations and information on rubber heels. Report No. 17,637.

A firm in Portugal desires to export crude rubber. Report No. 17,683.

A machine company in Chile is in the market for tubes for insulating purposes, samples of which may be examined at the Bureau of Foreign and Domestic Commerce at Washington or its branches. Report No. 17,722.

An association in Switzerland would like to establish commercial relations with American manufacturers of all kinds of rubber goods. Report No. 17,750.

A concern in Norway wishes to hear from American manufacturers and exporters of rubber tires, etc., with a view to securing an exclusive agency. Report No. 17,790.

A tobacco importer in Uruguay is in the market for rubber tobacco pouches, on which quotations are asked. Report No. 17,823.

A representative of a business firm with offices in the West Indies and New York states that he is in a position to represent American manufacturers and exporters of mechanical rubber goods. Report No. 17,860.

A South American firm desires to purchase rubber goods. Report No. 17,925.

A concern in France is in the market for rubber erasers, etc. Report No. 17,956.

A manufacturers' agent in Switzerland asks for names and addresses of American manufacturers of transparent nipples, garters, suspenders and other elastic goods, including fruit jar rings. Report No. 18,061.

CONSULAR REPORTS ON FOUNTAIN PENS.

Recent consular reports have contained numerous references to opportunities for the sale of fountain pens. One of these mentions the popularity of the fountain pen in Bohemia, where business men, students and clerks all carry pens of this sort, in qualities ranging from 60 crowns (\$12.18) down to 7 crowns (\$1.42) each. While pens of German origin have been the Argentine's favorites in the past, those made in England and America have also become quite popular.

In Argentina, where prices range from 42 cents for a pen of Austrian production up to about \$6.50, pens of American, English, French, German and Italian manufacture have been introduced.

FRANCE A MARKET FOR AMERICAN RUBBER GOODS.

A loss to the industry of one country may be a gain to that of another. Before the war France purchased on an average about \$11,000,000 worth of rubber goods from German manufacturers. Although the rubber industry is well developed in France and French manufacturers are well acquainted with all modern manufacturing methods, France before the war was tributary to Germany for many articles belonging to the rubber industry. When peace is established it is not likely that the low prices at which German rubber goods are offered will be so great an inducement to French purchasers as was formerly the case. Most certainly the French will have a strong aversion for all things German and the \$11,000,000 worth of rubber goods formerly supplied by German and Austrian manufacturers will have to be obtained from other sources; for it is not reasonable to believe that the demand for rubber goods will decrease quite the contrary.

Here appears a chance for American rubber manufacturers to introduce their wares to the French market. No doubt French manufacturers will do their best to obtain their share of Germany's lost trade. So will British, Belgian and Russian rubber manufacturers. But the organization and manufacturing facilities of American rubber factories should enable them to compete successfully in spite of the lower cost of labor in Europe and the high customs tariff that protects French rubber manufacturers in their home market. The following table, taken from "Le Caoutchouc & la Gutta-Percha," shows the latest annual imports of German rubber goods into France:

Description	Value.
Packings (Klingerite type).....	\$579,000
Rubber sheet	772,000
Rubber sheet (inferior quality—Continental type).....	579,000
Hard rubber	965,000
Dress shields	154,400
Rubber erasers	154,000
Suspenders, garters, belts, etc.....	135,100
Elastic fabrics	482,500
Card fabrics	67,550
Pneumatic and solid rubber vehicle tires.....	5,404,000
Rubber footwear (including tennis shoes).....	386,000
Asbestos	193,000
Mechanical rubber goods (belts, hose, valves, etc.).....	1,351,000
Total	\$11,222,550

A CHANCE TO START A RUBBER PLANT IN FRANCE.

An old friend of THE INDIA RUBBER WORLD, located in Paris, writes this publication that a Parisian capitalist who is interested in the rubber industry wants to effect a combination with some substantial rubber firm in a friendly country which desires to establish a plant in France. He offers on his part to furnish a particularly desirable location within a few minutes of Paris in a neighborhood which would supply unlimited labor. He would, at his own expense, put up the proper buildings, and would not ask the foreign firm to furnish a larger amount of capital than he himself is willing to put into the enterprise.

In one of the newest self-applied scalp treatments, where the water or chemical is heated by electricity and applied in the form of a fine spray, rubber tubes are so arranged that by blowing in one tube sufficient pressure is applied to the vapor to distribute it through the other tube to the scalp.

In an improved self-inking stamp called the "Autopad," instead of striking the same spot on the ink pad with each downward motion, the pad, which is $3\frac{1}{4}$ inches long, is made to move about $1/16$ of an inch with each stroke of the handle, so that the rubber face of the stamp comes in contact with a fresh pad surface each time. [The R. H. Smith Manufacturing Co., Springfield, Massachusetts.]

THE RUBBER TRADE IN BOSTON.

By Our Regular Correspondent.

THE summer season, now closing, has been only moderately satisfactory to the rubber trade in Boston. In fact, some lines have been more than usually quiet. Take the garden hose industry. Early orders in advance of the season were hardly up to the average. There was a spirit of conservatism, which proved wise on the part of customers in New England and the Middle Atlantic States, for—because of the very general frequency and extent of the rains this spring and summer—the retail demand has been so small that few or no repeat orders were received. The demand for fire hose has also languished, towns and cities postponing purchases and where buying was necessary cutting their usual orders in two.

Belting is in better demand. Belting leather has jumped to higher prices than ever before known, and this has given an impetus to the demand for rubber belting. There has been a fair business in tires and rubber clothing. It is an off week when we do not hear of some concern entering the rubber sole and heel field. Druggists' sundries are in good call. Makers of fruit jar rings have had a busy season. Mechanicals are most unsatisfactory.

* * *

The Avon Sole Co., of Avon and Brockton, Massachusetts, has made a great success of its soles and heels, which it sells to shoe manufacturers for attaching to leather shoes. The company manufactures its goods of a compound of rubber with ground-up leather fiber, making a sole which, it is claimed, is as waterproof as all-rubber soles, and more durable, also having an anti-slip quality. This concern, which started only a year or two ago, has found it necessary to double the size of its plant at Avon. The enlarged plant will be 300 feet long and 50 feet wide, two stories high, and will have a daily capacity of 12,000 pairs of soles. The factory will be completely rearranged and brought up to the point of highest efficiency. There will be separate rooms for mixing, calendering, molding, pressing, storing and shipping, and there will be a finely appointed laboratory and the usual business offices. The factory will have a spur track to the New York, New Haven & Hartford tracks, to facilitate shipping. This enlargement will be a much needed improvement, for so heavy has become the demand that for the past seven months the factory has been run double time in order to fill its orders.

* * *

The Hon L. D. Apsley, president of the Apsley Rubber Co., has not been much addicted to vacations, but he has lately taken one which was a vacation of the most beneficial kind. He sought out a little village on the Maine coast, far from city noises, electric lights, and even the sound of the motor horn, and there devoted himself to fishing, rowing and sailing. He is now back in his office in Hudson, as enthusiastic and energetic as when he first began making rubber clothing, thirty years ago.

And that reminds your correspondent that M. T. Bailey, secretary of the Apsley Rubber Co., who has been one of Mr. Apsley's trusted lieutenants for many years, has been very seriously ill for several weeks. He was to spend his vacation on an island four miles from the Maine coast. He had hardly arrived there when he was stricken with a heart trouble, which was the more serious because of the distance from medical help. However, at present writing the anxiety of his friends and family is greatly allayed, as he has materially improved within the last few days.

Maine seems to have its full share of vacationists this year. J. H. Stedman has just returned from his summer home in that state. A. S. Foster, who has for years boomed Goodyear Glove

rubbers in New England, spent several weeks up in the Winnebago region, fishing—and catching fish, too. Francis Appleton, Jr., is at present writing motoring in the White Mountain region, and Manager Porter, of the United States Rubber Co., has just returned from a motor trip in the same locality. M. A. Turner, of the Monaquot Rubber Co., is up at "Tim's Pond Camp" in the Rangeleys, and Ernest Jacoby is at Friendship, Maine.

Ernest Jacoby builded better than he knew when, back in 1909, he started the club which has since been incorporated and in his honor named the Jacoby Club of Boston. This club is best described as "a club for men to help themselves by helping others." Its object is to bring back to usefulness men who through intemperance or drug habits, or who through misfortune have become discouraged. How successful has been the work of this institution may be realized when it is mentioned that during the last full year 238 men have been helped by the club, most of whom at one time held good positions but through alcohol or other causes had gradually lost everything worth while in life. There is a club house on Newbury street, open at all times, where weekly meetings are held, and during the summer months outings are given weekly at the Riverside Recreation Grounds. Nearly a thousand men have been helped and enabled to get a fresh grip on life. Though started, with a membership of six, in Emmanuel Protestant Episcopal Church, it is undenominational.

Travelers along the line of the New York, New Haven & Hartford Railroad, in passing through Canton, day or night, on express or local, cannot fail to see the big electric sign which has recently been placed on the main factory building of the Plymouth Rubber Co., which reads, "The Home of the Slip-knot Rubber Heel." The company is doing specially live advertising.

* * *

Charles A. Coe, of the United States Rubber Co., and Chester J. Pike are looking eagerly forward to the date, early next month, when Mr. Kersey Coe (Charles Coe's son) and Mrs. Kersey Coe (Chester Pike's daughter) will arrive from Japan. It may be remembered that young Coe went to Japan as an agent of the Standard Oil Co. Miss Pike, his fiancée, made the long journey a year or two later, and the wedding was held in the American consulate. This visit will be the first vacation Mr. Coe has had since his transfer to the Japanese station.

THE RUBBER TRADE IN RHODE ISLAND.

By Our Regular Correspondent.

THE rubber factories in this state are working well toward full capacity and there are indications that they have orders enough on hand to keep them equally busy throughout the remainder of the year, at least. Factories that were closed a month ago for necessary overhauling and repairs have resumed either on full time or with night shifts. Some of the factories are at present operating on a busier schedule than in several years, and there is nothing to indicate any cessation of activity.

* * *

A deed was filed for record on August 17 at the office of the Town Clerk of Bristol, by which Robert S. Emerson, Trustee in Bankruptcy of the Consumers' Rubber Co. of that town, conveyed to the Narragansett Rubber Co., of Bristol, all the land, buildings, machinery and the entire equipment of the plant formerly owned by the Consumers' Rubber Co.

The Narragansett Rubber Co. was incorporated August 12, 1915, under a charter from the State of Rhode Island, the incorporators being Terrence McCarty, James P. Murphy and Florence F. Sullivan, who also constitute the board of directors.

The officers of the company are as follows: President and treasurer, Terrence McCarty; secretary, Miss Nora Leahy. Mr. McCarty has been in the business of manufacturing rubber goods, and has been engaged in various kinds, for many years. He was superintendent of the old Consumers' Rubber Co. plant, which has since grown from a small beginning to its present condition, employing over 500 people.

McCarty recently issued the statement that the new company has received high orders for footwear to keep the plant running at its present capacity for a year. For several years, he stated, the business of insulating wire was carried on at this factory, but workmen are now busily engaged in refitting the buildings formerly used for wire insulation for the purpose of making shoes, and when this is completed the number of employees will be greatly increased.

Mr. McCarty, as president, treasurer and manager, is to be assisted by practically the same force of office help and departmental foremen, all of whom have had long experience in the business and manufacturing ends of the rubber industry. The only exception is that of Charles Miller, who has resigned his position as shipper with the concern.

The International Rubber Co., at West Barrington, has just awarded the contract to construct a large vulcanizer at its plant, and work thereon will begin at once. It is to be of brick with tar and gravel roof and lined with tin. It will be 75 feet long, 24 feet wide and 21 feet high. Work of extending the rails of the New York, New Haven & Hartford Railroad across the highway into the yard of the plant for freight purposes is to be started soon. Other improvements are under consideration.

The addition to the plant of the Phillips Insulated Wire Co., Pawtucket, will be ready for occupancy early in September. The new structure has been in process of construction for several months. It is to be used entirely for rubber-covered copper wire, the manufacture of which for a long time has been carried on in other departments of the plant. It is of brick and has been erected according to most approved modern methods. Plans are now under way for another new building to be 100 x 70 feet, three stories high, of brick and mill construction.

Owing to its largely increased output, the management of the National India Rubber Co., Bristol, is trying out the plan of conveying its manufactured goods by auto trucks to Providence, a distance of about 12 miles, to be shipped by boat to New York and points to the south.

The wire insulating business at the National factory is rapidly increasing and additional facilities are becoming necessary to handle this department of the business.

The 50 young women employed at the National factory who board at the DeWolf Inn, which is conducted under the auspices of the company for the accommodation of its women help, were given a complimentary clam bake, on the farm of Colonel Colt, at Popkasquash, on Sunday afternoon in August.

The Revere Rubber Co. has received permission to erect a one-story frame building on Valley street, this city, for storage purposes.

Several departments of the Revere company are reported to be working at present, making solid tires for heavy trucks.

Thomas Birmingham, a veteran Revere employee, has returned from a vacation to his native town on Cape Cod, which he left 44 years ago, since which time he has never taken a day of leave. He left the "Cape" to accept a position with the Revere Rubber Co. and the Queen Dyeing Co. Mr. Birmingham formerly owned the land upon which the Revere Rubber Co. and the Queen Dyeing Co. now occupy, and at that time he has been in the employ

of one or the other of these three companies. His position for many years has been that of watchman for the Revere company, and, with one exception, he is the oldest employee of that concern.

Robert S. Emerson, of Pawtucket, Rhode Island, trustee in bankruptcy of the Cataract Rubber Co., of Providence, entered suit in the Superior Court for Providence County, on August 13, against Samuel J. Greene, of Providence; William J. Bullock, of New Bedford, Massachusetts, and Clarence H. Broley and George Kirk, of North Providence, to recover certain money that he claims was paid on a note made by the defendants as directors of the Cataract Rubber Co., May 5, 1914.

The plaintiff alleges that the defendants as such directors made a promissory note for \$5,500 payable to the order of George Kirk, and endorsed by each of them. On October 5, the sum of \$1,000 was paid on this note, it is alleged, by the Cataract Rubber Co. On the ground that it was an illegal transaction the trustee in bankruptcy is suing to get back the money so paid.

The Bourn Rubber Co., Providence, is working full time at present and is reported to have enough orders to keep it going for some time to come.

The Davol Rubber Co., Providence, is making surgical supplies which, it is reported, are going to the Red Cross forces abroad.

An ornamental wire fence has been erected by the American Electrical Works and the Washburn Wire Co., along the railroad front of the two concerns at Phillipsdale, in East Providence. The fence is designed to prevent their employees from leaving the plants and walking on the railroad tracks, where numerous accidents, several of them fatal, have occurred in the last few years.

Colonel Samuel P. Colt, president of the United States Rubber Co., is preparing to erect at his 400-acre country home at Poppasquash, Bristol, the largest poultry building in this part of the country. There will be accommodations for thousands of fowl, including hens, ducks and peacocks. Different breeds of poultry will be installed and the new house will be erected in close proximity to the \$75,000 barn that is now nearing completion.

H. C. Wagner, superintendent of the Woonsocket Rubber Co. mills at Woonsocket and Millville, with his family, has been spending a two-weeks' vacation at York Beach, Maine.

THE RUBBER TRADE IN TRENTON.

By Our Regular Correspondent.

THE Empire Rubber & Tire Co. has received a contract to supply all the tires used on New York's motor driven fire apparatus during the next six months. The fact that Empire tires met the rigid specifications demanded by the Metropolitan fire commissioners, is in itself a high testimonial to the worth of the product, and the Empire people are naturally proud of the distinction. Empire made hose is extensively used by the New York fire department. The last order was for 30,000 feet of cotton fire hose, rubber lined.

General C. Edward Murray, of the Empire company, recently entertained a distinguished party on board his yacht "Virginia." Chancellor Walker and Vice Chancellor Backes were included in the list of guests. After witnessing the boat races on Barnegat Bay the party went to Atlantic City, returning to Seaside Park by the outside route.

Vice Chancellor Backes in the Court of Chancery has declined

to name a receiver for the Trenton Scrap Rubber Co. Application for a receiver was made by Harry Freedman, a partner in the company, who alleged irregularities in the financial management of the company.

In refusing to name a receiver the vice chancellor required Isaac Fineberg, the other partner, to give a bond of \$50,000, so that receipts and expenditures may be accounted for pending the settlement of the disputed points at issue. Fineberg has filed a cross petition in which he asks that Freedman be compelled to live up to the terms of an alleged agreement for the sale of his shares in the business.

* * *

The Luzerne Rubber Co. has contracted for a sprinkler system to be placed throughout its plant.

The William R. Thropp & Son's Co. has taken possession of its new addition, which gives an extra working space of 61 x 125 feet. The company has a big list of orders and the outlook for the future is excellent.

* * *

The Delion Tire & Rubber Co. is making a black and white tire which has already met with a big demand.

A new outlet for inner tube seconds has been discovered along the Jersey coast bathing resorts. Bathers are using them by the hundreds as improvised "water wings." The tubes are inflated to as great a pressure as they will stand. The bather then adjusts the tube so that it rests against the back of his neck and the small of his back. The arms extending through the tube hold it in place. The bather after adjusting the tube may actually recline upon the water and can ride the breakers with perfect ease.

Charles J. and Nicholas Ribsam, Trenton young men, have gone to South America to conduct investigations upon industrial lines. It is said they will pay particular attention to the rubber trade and report on plantation possibilities.

* * *

The first annual outing of the Essex Mutual Benefit Association, composed of employees of the Essex Rubber Co., was held recently at Burlington Island Park. It was a huge success. Those who participated are already making enthusiastic plans for next year's outing. The large steamer "Twilight" was chartered to take the happy excursionists to the scene of their frolic. The

baseball game between the factory and office nines was the event of the afternoon. A feature of the outing was the appearance of the "Outing News," in the form of a special edition of the factory paper.

* * *

The John A. Roeblings' Sons Co. is erecting factory buildings 61 x 456 feet, 131 x 386 feet, 61 x 358 feet, and 58 x 89 feet, all two stories, of brick and steel construction, estimated to cost about \$150,000.

THE RUBBER TRADE IN CHICAGO.

By Our Regular Correspondent

GENERAL conditions in the rubber trade here during the past month have shown some improvement. In the mechanical rubber line some apprehension is now felt on account of the heavy rains throughout the western grain producing section, which threaten to reduce the crops as much as 40 per cent in some instances. The bad weather in this vicinity during the past month has discouraged automobile travel, and as a result the tire people are complaining, but the firms which deal in rubber clothing declare that they have done a good business, and on the whole are well pleased with the outlook for the season.

The rubber trade was gratified early in the month at the announcement of a settlement of the strike in the building trade, which for more than thirteen weeks had held up all construction work in the city. Since the men have returned to work there has been a marked increase in the demand for rubber matting, tire hose, tile, and the other articles handled by the rubber merchant.

* * *

The Quaker City Rubber Co. is remodeling its quarters on West Lake street, near Fifth avenue, and the interior will present quite an improved appearance when the workers are through, according to Manager A. Romani. The walls are being recalcimined in a color which will reflect more light.

The New York Belting & Packing Co. is now well settled in the fine new building recently completed at 124 and 126 West Lake street. There can be no question as to the advantage of the new location and the additional room is a boon to the company, which was rather cramped in the old quarters. One of the most striking features of the new building is the expansive plate glass front, which gives light to all parts of the store.



OUTING OF THE ESSEX MUTUAL BENEFIT ASSOCIATION.

band struck up a lively tune as the flag of the organization with the familiar "S X" in white letters centered in a blue field was raised aloft on the boat. The merry makers arrived at the park about 9 o'clock in the morning and after the badges had been distributed a day of rare sport was begun. Special games were arranged for the children of employees, under the supervision of Mrs. W. E. Sanders, wife of the firm's advertising manager. The card of athletic events was a varied one and the different numbers were successfully carried out, among them being interspersed comedy features, such as three-legged races, etc. A

Rubber men of the city took a great interest in "market week," which was celebrated here during the first week in August. Windows generally were decorated with signs put out by the Chicago Association of Commerce, "Made in Chicago." Hundreds of buyers were in the city, among them many merchants who were interested in the rubber business and who left substantial orders with local concerns. During the week the annual convention of the Retailers' Commercial Union was held in the city, its members taking active part in the festivities.

THE RUBBER TRADE IN AKRON.

By our Regular Correspondent.

THE month just passed has been marked by a continuation of vigorous output and development among the rubber manufacturing companies of Akron. Twenty-four-hour operating schedules are common, particularly in the factories turning out automobile tires. Several new tire companies are preparing to manufacture in Akron or nearby sections. Together they will strengthen materially the importance of this city as the center of the American rubber manufacturing industry. In Akron alone the factory extensions projected or under construction at present, total a value of \$2,000,000 for buildings, exclusive of equipment. Three-quarters of this valuation is credited to the Goodrich, Firestone and Goodyear companies and the balance to the Miller, Kelly-Springfield and Swinehart companies. This is making no allowance whatever for the investment by the new rubber manufacturing enterprises announced.

* * *

Suit has been brought in the United States District Court for the District of Connecticut at Hartford, by The B. F. Goodrich Co. against the Norwalk Tire & Rubber Co. of Norwalk, Connecticut. The complaint alleges that the Norwalk company is making tires so like the Goodrich cord tires as to infringe the Goodrich trade rights. The usual injunction and damages are asked for.

The new building now under construction for the Goodrich company will be devoted to the shoe manufacturing plant and will cost \$250,000.

B. G. Work, president of The B. F. Goodrich Co., returns about September 1 from a trip to the Panama-Pacific Exposition.

A. H. Marks, vice-president of the Goodrich company, is having erected a barn 30x100 feet for the accommodation of a considerable addition to his dairy herd at "Elmcourt." Mr. Marks is also having built a large dwelling for the occupancy of the people employed on his farm.

* * *

The Firestone Tire & Rubber Co. will install equipment to furnish its own electric lights and power.

There has been an unprecedented demand for motorcycle tires, and the Firestone company has increased its manufacturing facilities in this line. Much stress has been laid on the endurance of these Firestone tires as a factor in successful racing service.

* * *

President F. A. Seiberling, of The Goodyear Tire & Rubber Co., has been made a member of the American Aeronautic Engineers.

The Goodyear Service Pin Association will be incorporated with a capital of \$10,000, for the purpose of administering the fund recently donated by Factory Manager Litchfield. In addition to Mr. Litchfield, the incorporators are the following Goodyear men: Fred Colley, A. B. Cunningham, F. G. Hills, Al. Huguelet, Ed. Huguelet, G. M. Spaulding, G. E. Swartz and E. D. Viers. Each member will be issued as many shares of stock at \$10 a share as he holds service pins. A pin is given for each five years of service with the company.

Ralph H. Upson, of the Goodyear company, has been selected a member of the special committee to co-operate with the United States Naval Advisory Board in its consideration of the application of air craft to warfare.

The Goodyear company has established a sales branch in Manchester, England.

All Goodyear branches are to be equipped with suitable hydraulic presses for applying their S. V. truck tires. These tires are pressed on the wheels under a minimum pressure of 25 tons and require no other attachment.

During the first six months of 1915 the Goodyear company sold \$1,000,000 of tires, equivalent to their entire business for the year 1914.

The Kelly-Springfield Tire Co., after 18 years of litigation, has finally won its suit against the Diamond Rubber Co. of New York, for infringement of the Grant patent [No. 554,765, expired February 18, 1913] which covered the standard two-wire solid vehicle tire.

The award to the Kelly-Springfield company, which includes costs, damages and special fine, totals \$212,376.29. Early settlement is anticipated in several other parallel cases which are now in the accounting stage.

Kelly-Springfield Tire net earnings for the first half of 1915, after allowance for bond interest and preferred stock dividends, show approximately 25 per cent. for the common stock.

* * *

The Mohawk Rubber Co.'s new four-story building, costing \$30,000, will soon be completed, practically doubling the present capacity.

A rubber plant is to be built on a site in East Akron recently purchased by M. O'Neill. It is proposed to capitalize the new company for \$200,000, for the manufacture of tire accessories.

The Standard Tire & Rubber Manufacturing Co., Mark Gillen, president, is manufacturing automobile tires and tubes at Willoughby, Ohio.

The Giant Tire Co., of Akron, has equipped a plant for the manufacture of automobile tires.

The Falls Rubber Co., of Cuyahoga Falls, Ohio, has nearly completed a factory building with an area of 64,000 square feet, at a cost of \$85,000.

The Bucyrus Rubber Co., Bucyrus, Ohio, has resumed tire manufacture, under the superintendency of Grant Lambright.

The Adamson Machine Co. reports its plant running 24 hours every day.

The outing season has practically closed. In Akron it has been marked by a number of largely attended and successful occasions generously supported by some of the leading rubber companies for the recreation of their employees. In this connection the following rubber companies should be mentioned: Goodrich, Firestone, Kelly-Springfield, Miller, Mohawk, Swinehart, Rubber Products and Akron Rubber Mold companies.

THE RUBBER TRADE ON THE PACIFIC COAST.

By Our Regular Correspondent.

THE approximate number of motorists in California is 130,000, and they expend annually about \$15,000,000 for tires. The average cost of tires for motor cars is \$20 each, and the annual consumption, 750,000 tires. The majority of these are manufactured east of Chicago, chiefly by the leading rubber manufacturers. Capitalists familiar with trade conditions on the Pacific Coast might profitably consider the wisdom of venturing rubber manufacturing enterprises to profit by a share in this \$15,000,000 annual tire trade, as well as in general mechanical goods lines.

The B. F. Goodrich Co. has practically completed the work of guide posting the Lincoln highway, the last stretch reaching from Denver via Cheyenne, Salt Lake City, Carson City and Sacramento to San Francisco. A thousand posts were required, costing \$15 each erected.

* * *

The Midgley Tire & Rubber Co. is making an extensive canvass of California with the view of establishing a series of branch stores to handle trade in goods of its manufacture.

The Squires & Byrne Rubber Co. has recently re-located at 67 Stewart street, San Francisco, dealing in mechanical rubber goods and steam packing specialties. It also has a branch at 438 East Third street, Los Angeles.

The Colorado Tire & Rubber Co. has completed building additions which practically double the size of its plant.

The Dry Climate Tire Manufacturing Co. is erecting factory buildings at Arvada, seven miles from Denver. The company will manufacture tire casings and tubes specially adapted to withstand the dry climate of the Rocky Mountain regions.

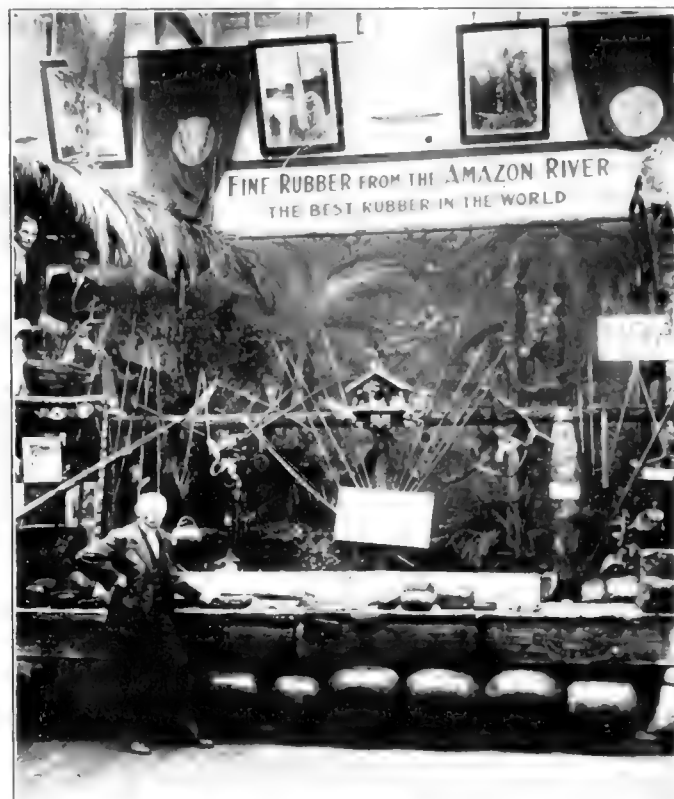
A FINE EXHIBIT OF AMAZON RUBBER AT THE SAN DIEGO EXPOSITION.

IT will be remembered what a magnificent exhibit Brazil had at the rubber exhibition in New York in 1912, and Brazil's exhibits at the London rubber shows have also been famous. It was the expectation of the Brazilian government to have notable exhibits at both the Panama-Pacific Exposition at San Francisco and the Panama-California Exposition at San Diego, but owing to the present financial situation in that country, the Brazilian Congress at the last moment concluded not to be officially represented at either of those expositions.

Dr. Eugenio Dahne, however, who was one of the Brazilian commissioners at the World's Fair at St. Louis in 1904, and had been in general charge of the Brazilian exhibit in New York in 1912, and had held the office of Commissioner General to the United States and Canada, representing the Minister of Agriculture, Industry and Commerce of Brazil, had been working for several years to obtain Brazil's participation in the two California expositions and when his government decided not to be represented officially, he determined to arrange for a private exhibit of Brazil's most important products at the San Diego Exposition. With this in view he returned to Brazil last January and succeeded in collecting a large number of exhibits showing the various industries in which Brazil is engaged. He was fortunate enough to secure from the Minister of Agriculture the entire collection of rubber displayed at the exposition in Rio de Janeiro in 1913 and which had been kept intact with the expectation of sending it to the London exhibition held in July, 1914, but which the government later decided not to send.

This Brazilian exhibit at San Diego was officially opened on the fourth of July by the president and other officials of the exposition. It is described by the press of California as one of the finest features of the fair. It occupies a space of 115 feet front by 15 feet deep. Dr. Dahne has divided his exhibit into three sections, showing products from the North of Brazil, from Central Brazil and Southern Brazil. The first section con-

sists largely of a display of rubber from the Amazon. There are five tons of samples of crude rubber, including every variety



FRONT OF RUBBER EXHIBIT—AMAZON JUNGLE IN BACKGROUND.

sists largely of a display of rubber from the Amazon. There are five tons of samples of crude rubber, including every variety and shape of crude rubber produced in the Amazon district and adjoining states. There are huge balls and sheets of Sernamby, blocks of caoutchouc, crêpe-sheets and biscuits of Maniçoba and Mangabeira. One case alone contains samples of sixty different varieties. The implements used by the rubber gatherers are also shown, and rule rubber shoes, pouches and clothes bags of rubber made by the natives, while a large collection of excellent photographs explains the different processes of gathering and preparing the rubber.

As a fitting background and setting, there is reproduced a life-like scene of an Amazon jungle, flanked by the reproduction of the two-story native house of the rubber gatherer—the "Roosevelt Cabin," shown in one of the photographs.

The outside walls are bedecked with hunters' trophies, the heads and skins of deer, wild bear, the South American jaguar, the otter, the sloth, monkeys, birds, and other animals, and collections of Indian bows, arrows, clubs and lances.

This whole Brazilian exhibit is particularly fine and has proved exceedingly interesting to all visitors. Considering that Dr. Dahne has brought this great collection together with comparatively little aid and is making this exhibit on his own personal responsibility, it is a monument to

his energy and capacity for this sort of work. That his efforts have been duly appreciated, not only by the visitors to the ex-



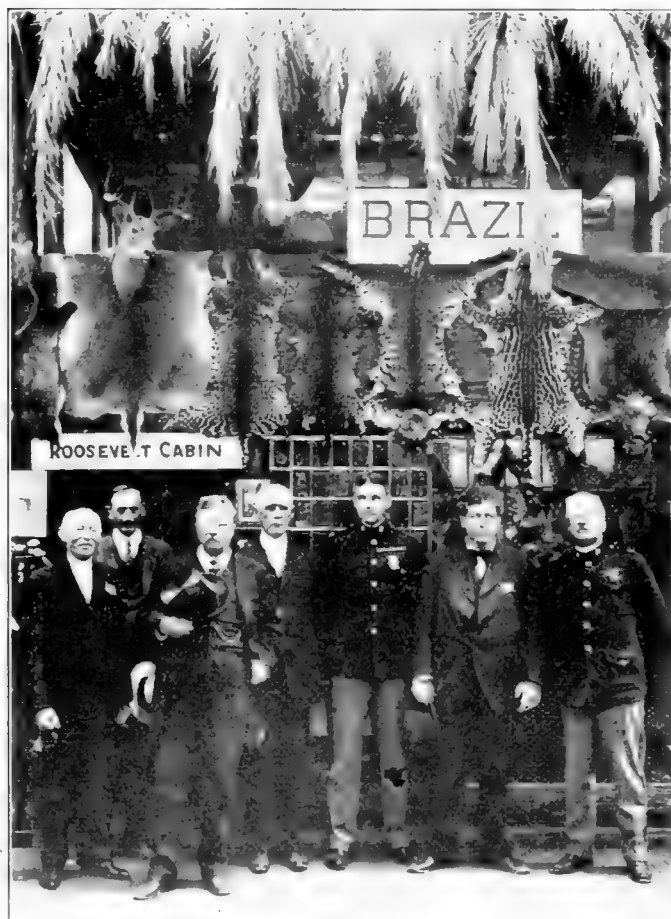
GENERAL VIEW OF THE EXHIBIT.

sists largely of a display of rubber from the Amazon. There are five tons of samples of crude rubber, including every variety

...and by the series of award, will be seen by the fact that two grand prizes, two gold medals and four silver medals have been bestowed upon this exhibit; one grand prize going to the Brazilian Minister of Agriculture for his generous loan of exhibits, the second grand prize going to the government of the State of Sao Paulo. A gold medal has been bestowed on Dr. Dahne in recognition of his efforts in assembling this exceptionally fine display. The other gold medal went to the government of the State of Parana, while the four silver medals went to different companies in Para and Rio de Janeiro for individual exhibits.

One of the most interesting days which the exposition has yet seen was on the occasion, late in July, when it was visited by Colonel Roosevelt and party. As the ex-President spent one of the most exciting winters of his life in the Brazilian jungle, he was strongly attracted to the Brazilian department. He was particularly interested in the rubber gatherer's cabin, which Dr. Dahne labeled "Roosevelt Cabin," although it is probably considerably more spacious and comfortable than the quarters which the famous explorer enjoyed while canoeing down the "River of Doubt."

It has been practically decided to continue the exposition another year, and Dr. Dahne expects to go to Brazil in October



COL. ROOSEVELT AND DR. DAHNE (AT THE EXTREME LEFT) IN FRONT OF THE ROOSEVELT CABIN.

with the hope of bringing back even a larger and more complete collection of Brazilian products than he now has. He earnestly hopes that the American manufacturers of rubber goods will also be interested and that his exhibit may include not only crude rubber but a variety of manufactured goods. He would be glad to have any manufacturer interested in the communicate with him, in care of the exposition.

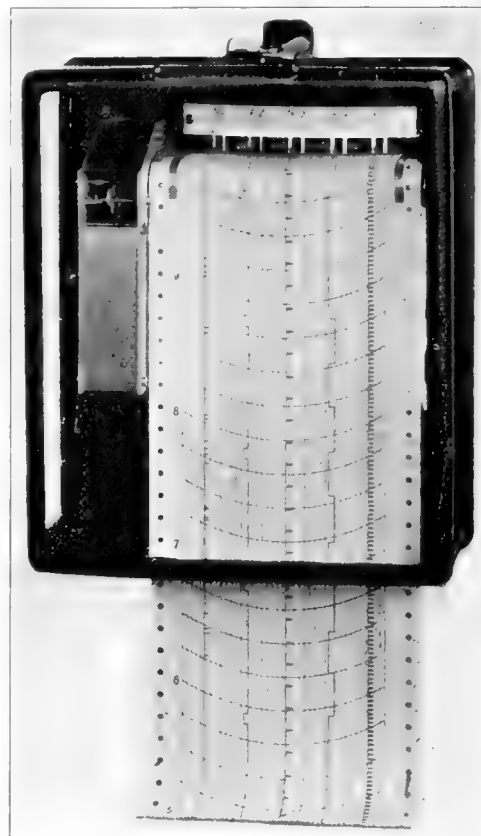
A GRAPHIC EFFICIENCY INSTRUMENT.

It is one thing to establish a standard of efficiency in the operation of a calender, mixer, or a press vulcanizer, but it is quite another to maintain standards in all of the machines used in the manufacture of any line of rubber goods. The speed and temperature of the mixer and calender rolls should not exceed certain limitations. So too in vulcanization, the temperature and duration of a cure should always be the same for like goods. Indeed in most of the other operations in rubber manufacture a uniform product is largely dependent on the exact operation of the machinery. In establishing a system of efficiency the first thing is to be able to measure each machine's output.

The Esterline meter is an instrument which makes a continuous record of the performance of washer, mixer, calender or vulcanizer. Any varying quantity, whether it be speed, temperature, pressure, feet per minute, miles per hour, volts, amperes, kilowatts or horse-power, is registered. The record is written in ink by a pen, on a chart propelled at a uniform rate, and is an exact graphic representation of the quantity measured.

The illustration shows a five-pen service instrument that can be used in recording the operations of rubber mills and calenders. The solenoid controlling each pen is connected with separate terminals on the instrument, and therefore each pen can be controlled separately. Normally the pen will draw a straight line on the paper, and at the moment of closing the contact in its particular circuit, the pen will deflect about a quarter of an inch to the right. It will then continue to draw another line parallel to the zero line until the contact is broken, and if the contact is a fairly quick make and brake the pen will draw a straight line at right angles to the zero line.

The instrument can be located at any distance from the machine under observation. Two wires are carried from the machine to the instrument and a simple contact arranged on the machine closes the circuit at the completion of each revolution, or completion of an operation. [The Esterline Co., Indianapolis, Indiana.]



A new tire and tube vulcanizer has been put on the market which can be operated by the current supplied by the six-volt lighting, starting and ignition system now a part of the standard equipment of many automobiles. A thermostat regulates the temperature for vulcanization. [Corbett & De Coursey Co.]

The India Rubber Trade in Great Britain.

U.S. Coast Guard cutter, *Albatross*

A TOPIC that is receiving considerable attention at present is the prevention of rubber getting to Germany from neutral countries. There seems to be some doubt as to whether the Mining Lane that the late government had opened up for Trade Department and the Tin and Rubber Export Committee with the Netherlands Oversea Trust, are not completely efficacious in preventing rubber from arriving in Germany. A somewhat difficult factor in the case is the fact that many of the Dutch companies extracting, or many of the Mining Lane merchants. The Scandinavian countries have certainly been importing much more rubber than has been allowed by the British Government. It is true that as the most important source of supply for the German market is very largely India, it is not surprising that the British Government has sent goods and has the impression that they will be able to control the traffic sufficiently to prevent such a large quantity of rubber coming at their disposal. Moreover, it is known that there is a great deal of traffic that formerly went via Hamburg into Denmark, and did not come under the supervision of the British Government.

which are now using lithopone to a much greater extent than formerly. A good deal of American zinc oxide is being used in Great Britain. With regard to the quality of this compared with the Vicille Montague brands, the rubber works are of opinion that it is not so good, owing to the presence of small quantities of other metallic oxides. On the other hand an eminent zinc expert who is familiar with the works in New Jersey, tells me that the zinc oxide produced there is quite as pure as the best Vicille Montague. One is therefore forced to the conclusion that some if not all of the rubber manufacturers in Europe are getting a second grade product, while the very best is either retained for American consumption or goes to a favored few. Or again it may be purely a matter of price and that the highest quality can be obtained by all who will pay for it. Quite recently a new zinc oxide works has been started not so very far from London. The process adopted is that of the Vicille Montague company, viz., burning the metallic zinc, and I am not surprised to hear that the works are extremely busy with orders from those who require the very highest quality.

British barytes producers, stirred up by officers of the Geological survey and officials of the Board of Trade, are actively engaged in filling the void caused by the cessation of German supplies. We have the raw product in abundance, but largely owing to lack of technical skill in grinding and finishing, and to absence of special freight terms, the German product had obtained a good hold in this country, both as regards quality and price. British rubber works are now using the home product, but they are paying a considerably higher price than they used to pay for the German. It remains to be seen what will happen after the war, but it would certainly seem that having the raw material at hand we ought to have no difficulty in bringing our production of the properly finished product up to the mark.

RUBBER TIRES INCREASE EFFICIENCY.

That rubber tires increase the efficiency of steam trucks, is a statement made by the president and general manager of perhaps the largest hauling and trucking concern in England, which uses an immense fleet of steam-propelled trucks. Some of these are equipped with steel and wooden plug tires, and some with solid rubber tires, and they find that the latter make their steamers far more efficient.

TRADE NOTES.

The Peerless Seamless Rubber Co., Limited, has been registered in London, with a capital of £2,000, with offices at Station Road, Richmond, Surrey.

Imports of wires and cables—rubber and other insulations—into the United Kingdom, from all countries, in June last, amounted to \$21,398; while exports of similar goods for the same month were valued at \$348,480.

The Council of The Rubber Growers' Association, of London, at a meeting held July 26, appointed a special committee to further consider the questions of dealings in rubber with men of hostile origin and shipments of rubber to neutral countries.

The general manager of the Dunlop Rubber Co., Limited, of Birmingham, England the Hon. Mr. Muirhead has recently been making a tour of Ceylon in the interests of the company.

The British Insulated & Helsby Cables, Limited, of Helsby, England, has recently erected a building set apart for female operatives. Light machines for the main works have been installed there and girls are being trained systematically as operators, due to shortage of male labor, owing to enlistments. The company is busy manufacturing power feed cable and has transmitted some orders to the United States.

The Russian Government advises that certificates of origin will be required for importations into the Empire of rubber and gutta percha.

BRITISH IMPORTS OF GUTTA PERCHA.

The following table shows a comparison between British imports of crude gutta percha during the years 1913 and 1914.

From	1913.		1914.	
	Pounds.	Value.	Pounds.	Value.
Straits Settlements	5,115,600	\$2,687,929	1,670,100	\$836,565
British Guiana	963,300	643,478	795,000	517,367
British West Indies	71,000	47,426	77,000	47,852
Other British	142,400	44,193	84,600	21,933
Total British	6,292,300	\$3,423,026	2,626,700	\$1,423,717
Venezuela	2,372,400	\$1,547,211	974,600	\$569,531
Dutch Guiana	930,000	774,960	239,100	184,942
United States	469,500	276,573	638,100	371,640
Germany	494,200	285,975	303,600	188,528
Other foreign	565,600	362,549	450,000	281,250
Total foreign	4,831,700	\$3,247,268	2,611,400	\$1,595,891
Grand total	11,124,000	\$6,670,294	5,238,100	\$3,019,608

The great proportion of the gutta percha shown in the above table as imported from the Straits Settlements came originally from the Dutch East Indies, having come to the Straits Settlements for re-shipment.

FRENCH IMPORTS AND EXPORTS OF CRUDE RUBBER AND RUBBER GOODS.

The following table shows the weight in pounds, together with the value in dollars, of the imports of crude rubber and rubber goods into France, and also the exports, during the calendar year 1914 and the first four months of 1915.

DESCRIPTION.	1914		1915	
	Pounds.	Value.	Pounds.	Value.
Crude rubber	25,448,280	\$15,716,762	14,276,460	\$8,817,205
Non-vulcanized pure rubber				
Sheet	170,280	261,515	18,480	24,511
Vulcanized rubber thread	240,460	379,631		
Elastic fabrics	154,220	270,586	319,660	524,381
Rubberized fabrics in pieces	86,020	90,517	64,680	67,550
Dress shields	27,940	68,531	1,320	965
Suspenders, garters, belts, etc.	9,240	24,318		
Rubberized garments	52,580	101,518	117,040	218,283
Rubber footwear	165,220	101,518	100,760	60,023
Tire casings, inner tubes, solid rubber tires, etc., for cycles, automobiles and motor trucks	1,756,480	2,696,596	10,081,940	14,284,123

Description.	Four Months 1914.		Four Months 1915.	
	Pounds.	Value.	Pounds.	Value.
Crude rubber	7,335,900	\$4,530,675	1,164,680	\$719,311
Non-vulcanized rubber sheet	33,370	35,898		
Vulcanized rubber thread	72,820	115,078		
Elastic fabrics	35,200	61,760	165,880	272,130
Rubberized fabric (in pieces)	39,160	41,302	2,420	2,509
Dress shields	220	579		
Suspenders, belts, garters, etc.	1,100	2,895		
Card fabrics	22,540	8,878	4,840	3,667
Rubberized garments	9,700	57,321	62,040	115,607
Rubber footwear	1,354,100*	831,637	11,120	6,755
Solid and pneumatic tires	182,160	279,657	1,818,520	2,576,550
Total	9,096,270	\$5,965,630	3,224,600	\$3,696,529

* Does not include 1,078,000 pounds of rubber footwear imported by the Government for army purposes.

THREE PIRELLI BROTHERS AT THE FRONT

A personal letter received a few days ago from A. Pirelli, of Pirelli & Co., Milan, Italy, by a New York friend, states that his three brothers are at the front with the Italian troops while he has been commanded by the military authorities to oversee certain operations for the government now being carried on at his works. He writes as follows:

"I am commanded at the works, where we are working day and night for the supplies to the army and navy—several of our departments having also been militarized—but my three brothers have all joined the colors, my brother Piero, who is also one of the managing partners of our firm, being attached to the staff of the Commander-in-Chief, and my two young brothers being both in a cavalry regiment, but one of them is now going to enter the Aviation Corps."

Rubber plantations in Selangor, Federated Malay States, show a material increase over last year. The total area under rubber amounts to 245,503 acres.

The Rubber Trade in Germany.

By Our Regular Correspondent.

WHEN the war broke out German business circles recognized that the extraordinary conditions it created would have a far-reaching effect on the commercial and industrial life of the empire. But there still seem to be a good many people in Germany who have not yet been impressed with the changed conditions, and among them are quite a number of dealers in the rubber trade, who complain very loudly that the manufacturer does not turn out their orders as acceptably and as rapidly as he would in normal times. The rubber journals are taking these complainers to task, and seeking to convince them that under present trade conditions they should make all proper allowances for the extraordinary difficulties under which the manufacturer labors, and that they should not be too insistent on immediate deliveries or on getting exactly the quality at precisely the price mentioned in their orders.

The Allies' blockade is being felt more and more each day, and the list of rubber goods "no longer obtainable" is increasing constantly. Each day increases the inconveniences created by the lack of raw materials, and the discovery, or even the pretended discovery of some new substitute, for a scarce or "no longer obtainable" raw material is heralded throughout the press. It was announced lately that the Kaiser had motored to the front in a machine equipped with artificial rubber tires. Immediately the press announced that the great problem had been solved, that artificial rubber was at last practicable, that Germany would no longer have to rely upon foreign countries for her crude rubber supplies. Rubber would now be home-made. It appears, however, now that the much talked of artificial rubber tires of the Kaiser's automobile were only experimental ones, produced at great cost, or at least at a cost that would prohibit their being produced on a commercial basis, or even on a basis permitting their use for the present military needs.

Another substitute that is receiving wide publicity in Germany appears to offer greater possibilities. It is known as "textilose," and is to be used as a substitute for the jute Germany formerly imported in great quantities from British India.

Textilose is made by spreading paper on a fiber gauze and cutting the product in strips, which are then spun into a yarn and can be woven in a similar manner as other paper yarns. Two factories are said to be producing about 44,000 pounds of textilose bags per day, and it is also stated that over 40,000,000 marks (\$9,520,000) have been subscribed for the promotion of the manufacture of this jute substitute both in Germany and abroad.

Speaking of textiles it is interesting to give the following table, which shows the extent to which Germany was dependent upon foreign lands for her supply of these raw materials. These statistics are for 1913, which was the last complete statistical year:

Articles.	Origin.	Value.
Cotton	United States, India and Egypt	\$139,777,400
Wool	Australia, Argentina and Cape Colonies.....	87,798,200
Jute	East Indies	18,088,000
Flax	Russia, Austria-Hungary	18,188,000
Hemp	Russia, Italy	10,710,000
Ramie	China	547,400
Manila hemp	Philippine Islands	1,098,800
Sisal hemp	Mexico	36,120,000
Raw silk	China, Italy	47,400,000

When the war broke out there was a very large supply of cotton, and even after the beginning of hostilities, large quantities of raw cotton from time to time reached Germany.

Manufacturers used freely of this supply, with the result that when the Allies tightened their effective blockade the supply of raw cotton was considerably depleted. Since August 1 the manufacture of cotton goods has been absolutely prohibited. The government's order is far reaching and strikes all kinds of goods made of cotton or containing any of this staple. Without distinction it prohibits the manufacture of all cotton yarns, cotton threads, fabrics, wearing apparel, bags, belts and all woven or knitted goods containing cotton. Since August 1 it has been legal to use cotton only in the manufacture of military requisites. Long before the government decided on these restrictions the price of raw cotton had reached the alarmingly high price of 30 cents per pound. The efforts made to encourage the planting and harvesting of hemp and flax have not yet given any material results.

Another government operation of great importance to the rubber industry is the recent seizure of all supplies of sulphur. However, the seizure of the sulphur supplies is considered an advantage to the rubber trade, for the government has promised to distribute sufficient quantities to answer the immediate needs of all.

Lubricating oil is becoming so scarce and its price high that only few rubber manufacturers can afford to use it for their machinery. Even graphite, which is used as a substitute therefor is becoming rare and expensive.

The Allies' blockade has created such a rubber, gutta percha and copper famine that the D. V. E. (Union of German Electrical Engineers), which fixes the standards for rubber and gutta percha insulated wires, has been obliged to modify its standards to make their observance possible under present conditions. As far as possible iron will be used instead of copper and rubber and gutta percha insulations will be replaced by impregnated paper wherever practicable. In cases where impregnated paper cannot be used, reclaimed rubber will take the place of the usual insulator until normal conditions are re-established.

The war has increased interest in farming here, and farmers, owing to lack of labor, are obliged to use modern machinery to a much greater extent than they formerly did. This creates an unusual domestic demand for many rubber mechanical articles, and especially for belts, in view of the fact that the use of leather for other than military purposes is strictly forbidden. But, because of the high cost of raw materials necessary for making these belts, it is almost impossible for manufacturers to make reasonable profits in producing these necessities. Of course those who had a large stock of belts on hand are securing large profits, for farmers are glad to take what they can get and are using all sorts of belts on their threshing machines and other agricultural implements.

Packings and the like that can easily be made of substitute materials are giving but little trouble. The hose industry generally speaking is dead. No orders are forthcoming; people who use hose are doing the best they can by keeping their old hose in repair.

Before the war, maritime as well as river navigation offered a great market for all sorts of mechanical rubber goods. River navigation is at a standstill through lack of freight and lack of hands; maritime navigation, as far as Germany is concerned, is stopped almost entirely by the activities of the Allies' fleets.

In a word, the rubber industry here is badly affected by the war, and were it not for government orders for tires and

other mechanical and surgical rubber goods, the whole industry will be at a dead standstill.

THE GERMAN SYSTEM.

As an illustration of the thoroughness with which the Germans conduct their military operations, a paragraph in a letter recently written from northern France is interesting. The writer says:

"After every battle in which the Germans have been victorious the field is literally scoured, and all the junk is transported to headquarters. Scores of ripped and torn auto tires are collected and sent to an establishment where the rubber can be utilized in the making of new tubes."

GERMANY SAVING EVERY SCRAP OF RUBBER WASTE.

The saving of every possible scrap of waste rubber has now become such an important matter in Germany that not only the imperial government but state and municipal authorities have taken the matter up; and the Red Cross organization particularly is instructing the public in regard to collecting old rubber articles so that nothing shall be missed. The newspapers even go to the extent of giving general instructions as to how waste rubber articles shall be sorted before being turned over to the factories for use, so that the delay of re-classification may be avoided.

On June 1 Austro-Hungarian rubber manufacturers increased their prices for rubber goods from 50 to 100 per cent.

RUBBER FAMINE IN DENMARK AND IN SWEDEN.

For a long time Danish rubber imports have been restricted by Great Britain lest some of these imports find their way to Germany, in spite of the Danish embargo on rubber exports. This resulted in a rubber famine in Denmark. Now that Danish rubber manufacturers have assured England that they would not allow the Danish embargo to be violated, the British government is allowing Denmark sufficient rubber for domestic needs. Sweden has refused to place an absolute embargo on rubber exports, and great Britain's restrictions on rubber shipments to that country are therefore maintained, with the result that the rubber shortage is becoming acute in Sweden.

The cargo of the Swedish steamer "Fridland," recently seized by the British on the way from New York to Copenhagen, Denmark, included 56 tons of rubber, marked on the cases and entered in the bill of lading as "gum."

The scarcity of rubber in Norway is said to have led to the withdrawal from service of many public as well as private automobiles and to the opening of negotiations by the Foreign Office and the Royal Automobile Club with the British government for the purchase in London of limited quantities of rubber.

IMPROVEMENT OF PLANTATION HEVEA.

The *Hevea Brasiliensis* tree shows much variability in the rubber plantations of Malaya and the officials of the Botanic Gardens, Singapore, are attempting to mark the best among the old trees that they may serve as parents for improved stock. The work of selection will cover many years. It commences with the comparison of a tree with tree as judged by the yield of latex.

PLANTATION RUBBER.

It is very probable that this year's exports of plantation rubber will exceed the totals of all previous years. For the first three months of 1915 statistics show that crude rubber exports from Malaya and Ceylon to Great Britain, in spite of the war and the consequent shortage of shipping facilities, exceeded those of the corresponding period of 1914 by 7,940 tons.

SOME RUBBER PLANTING NOTES.

RUBBER EXPORTS FROM BRITISH MALAYA.

THE London "Financier" gives the following table showing the quantity and value of exports of rubber from Malaya during the past nine years:

	Exports. Tons.	Average Price per Pound.	Total Value.
1906.....	430	5/0	£240,800
1907.....	885	4/6	446,040
1908.....	1,629	4/0	729,892
1909.....	3,340	7/0	2,618,560
1910.....	6,504	6/0	4,370,688
1911.....	11,500	4/0	5,172,000
1912.....	21,305	4/0	9,548,901
1913.....	35,352	3/0	11,872,224
1914.....	46,047	2/0	10,314,668

Comparatively little has been added in the last two years to the area under rubber in British Malaya. Three years hence all the trees on the plantations should be in bearing, but although this will mean a great increase in supply, little fear of over-production is felt among Malayan planters, who believe that rubber will always be in sufficient demand to command prices affording a reasonable margin of profit.

PRODUCTION OF OLD HEVEA TREE.

Bulletin No. 13, Department of Agriculture, Ceylon, gives particulars of the tapping of an old *Hevea* tree at Heneratgoda. It is one of the original seedlings sent from Kew and planted in 1877. It stands close to a hard road and with two other trees within fifteen feet of it. In less than five years it yielded nearly 400 pounds of rubber.

A tapping test was begun December 5, 1908, and continued daily on a full herring-bone system of three V's, the cuts being one foot apart and the lowest cut one foot from the ground. The fourth section was completed January 17, 1911. The yields from these four sections were as follows:

	Days tapped.	Total rubber. Lb. Oz.
Section 1.....	153	43 9
Section 2.....	185	43 7
Section 3.....	137	34 13
Section 4.....	125	50 3
Total.....	600	172 0

Tapping on the renewed bark of section 1, which was two years and four months old April 1, 1911, yielded 100 pounds 10 ounces of rubber in 209 days of tapping.

Sections 2 and 4 and Section 3 were tapped on renewed bark in two different tests in 1912. The tree was tapped, with short intervals, over a period of four years and nine months, with the following total yield:

	Lb. Oz.
Original bark.....	172 0
Renewed bark, section 1, completely tapped.....	100 0
Renewed bark, sections 2 and 4, partly tapped.....	22 9
Renewed bark, section 3, completely tapped.....	97 4
Total.....	392 7

FEDERATED MALAY STATES RUBBER EXPORTS.

An official cablegram received from Kuala Lumpur announces that the export of plantation rubber from the Federated Malay States during the month of July amounted to 3,687 tons, as compared with 3,403 tons in June and 2,971 tons in the corresponding month last year.

The following is a comparative table showing the export for three years:

	1913. tons	1914.	1915.
January.....	2,131	2,542	3,473
February.....	1,757	2,364	3,411
March.....	1,737	2,418	3,418
April.....	1,626	2,151	2,777
May.....	1,235	2,069	2,708
June.....	2,005	2,306	3,403
July.....	1,781	2,971	3,687
Total.....	12,262	16,821	22,877

RUBBER YIELD IN THE MALAY STATES.

The reports of the different rubber plantation companies of the Federated Malay States show that the increase in production of crude rubber in 1914 over 1913 ranged from 9 to 77 per cent. Few estates show an increase in production of less than 20 per cent., while the average increase was about 23 per cent. The yield per acre varied between 230 and 447 pounds, the prevailing figure being about 300 to 350 pounds.

RUBBER IN SOUTH KURG, INDIA.

Ceara rubber grows almost in a wild state in the Kurg province of British India and the jungle growth has to be removed each year to enable the tappers to get about. At the conclusion of the tapping the tapping wounds are smeared over with a boiled solution of unslacked lime, sulphur and resin, to which cow dung is added to make a consistent paste. This solution is said to assist the trees in rapidly recovering from their wounds. The Ceara tree is more delicate than the *Hevea* and the practice is to tap but one-quarter of a section of the surface so as not to endanger the life of the plant. Some of the second generation of trees, planted in the early '80's, tapped in the half-herring-bone style on a quarter surface to a height of 6 feet, have yielded on an average 2½ pounds of dry rubber during the three months of the tapping season, but the test was too severe and the trees soon died.

THE RUBBER TESTING STATION FOR JAVA.

A meeting in connection with the installation of a central rubber testing station for Java took place June 2 at Bandoeng, Java. The chairman announced that a generous friend had offered to provide a laboratory and that the government had promised to erect the necessary buildings free of cost. A sum of 19,500 florins (\$7,839) was subscribed at the meeting. The total needed is 23,000 florins (\$8,246). The committee will undoubtedly be able to start the work of installation soon. The station will be under the control of the Department of Agriculture at Buitenzorg.

REVIEW OF THE BALATA INDUSTRY IN DUTCH GUIANA FOR 1914.

By a Resident Correspondent.

THE European war and the new balata ordinance, without any doubt, were responsible for the damaging consequences on the colony's principal industry. When the war broke out in August of last year the balata industry in Dutch Guiana was in a flourishing condition and, today—one year later—the industry is a mere skeleton of its former robust condition.

To review the many *pros* and *cons* that have also helped to nearly destroy at least for the present the colony's most valuable asset, would be too long a tale to tell. To be brief, however, I will deal with the two main factors which were directly responsible for the stagnation in business, and which certainly had a most disastrous effect on the people of the colony, who, directly and indirectly, derive their existence from the balata industry.

The two largest concerns in the colony are financed from Holland. When the trouble in Europe began, and the impossibility of shipping balata was realized, the first black cloud in the horizon began to appear. It will be remembered the bulk of balata produced in Suriname normally finds its way to Germany via Holland. The entrance to that country was closed, no shipments could be made, and in consequence no bills could be negotiated. This state of affairs was made worse by the new ordinance, which came into force about that time, and which created a monopoly for the two Dutch companies in question.

The public, of course, were up in arms at what they considered an unfair advantage taken of them by the passing of these laws. Newspaper comment was sharp and bitter, and the public

was on the point of rebelling, but, unfortunately, the spirits of the people are easily subdued, and as a natural consequence the matter was treated, like everything else here, as "a nine days' wonder," and public opinion was again quieted. **THE INDIA RUBBER WORLD**, through its correspondent at Dutch Guiana, made mention of the state of affairs existing in the colony on two or three occasions, and the matter was also the cause of some firm but polite diplomatic correspondence between Washington and the Hague; so much so that matters have been set right, and the inhabitants of the colony must thank the United States authorities for their deliverance. A well known New York firm carrying on extensive balata operations in the colony, was threatened by the new ordinance—with the loss of several hundred thousand dollars, which was invested in the industry, and it is only because of the tact of their local representative, backed by an able colonial lawyer, and as mentioned already the interference of the authorities in Washington, that the situation was saved, and today one and all are able to invest money in balata undertakings on equal terms.

It would be out of place in correspondence of this nature to make public the under-handed actions of certain colonials concerned in this affair. Suffice to say the worst has passed and the colony in the near future conditions being normal will again make good.

Under the circumstances already recorded it could hardly be expected that the past year should prove a prosperous one. Apart from the war, and the trouble over the new ordinance, from the effect of which the peasant proprietors and laboring classes suffered considerably, there was also a large increase in the price of imported foodstuffs from the United States, which advanced the cost of living fifty per cent.

Trade in the colony continues to be depressed. All future financial arrangements are uncertain, and money is still being withheld, the circulation of which would be of great assistance to trade.

There are several thousand kilos. of balata tied up in the country awaiting a market, and this also has proved a further handicap to the industry. But holders of the product are sanguine of higher prices in the near future, and are holding on, although no reasonable offers would be refused. The production of balata for the year past, 1914, was 1,018,818 kilos., and the greater part of this is now in the colony.

I have written before on the subject of fostering trade relations between Dutch Guiana and the United States. I am convinced if United States interests were more extensive in this colony the present existing hard times would be unknown.

Why does American trade with Dutch Guiana lag so far behind? The bulk of foodstuffs consumed in the colony come from the United States; not a pound of beef, pork or flour eaten by balata men, gold men or anyone else comes in from any other country, and still our trade relations are so far behind what they should be.

In order to have all the information required by the producer and the consumer, I would suggest the co-operation of the United States government, which is showing great interest now in foreign trade. The American consul furnishes reports, but they are necessarily inadequate, since the consuls have no time to do this work. If the consulate had a commercial department, managed by a man of local business experience, in my opinion it would have some good results in drawing attention to the colony.

The people in Dutch Guiana are keen for American trade, and this is the time to act. Dutch Guiana certainly offers great inducements to the people of the United States if they will come down here with that spirit of enterprise which has made them famous at home. As far as this colony is concerned, it would be perfectly possible to realize the dream of the statesmen of both continents, namely, "America for Americans!"

AS TO CONDITIONS IN DUTCH GUIANA.

THE EDITOR OF THE INDIA RUBBER WORLD:

In your issue of July, on page 500, appears a letter signed by J. S. Lawton in which the writer emphatically contradicts the contents of my contribution which appeared in the April issue of your paper under heading "Trade Opportunities in Dutch Guiana."

I was not in the least surprised to read the statements contained in that letter. Certain persons have been endeavoring to inflate local conditions with the object of quieting the minds of those people in the United States who have invested their hard-earned savings in a certain enterprise in Dutch Guiana, and naturally my article would be the means of creating considerable unrest among these investors.

Any one in the colony can prove that when my article was written the government was sending away balata men by the hundreds monthly, as there was nothing for them to do; and to avoid misery and, perhaps, internal trouble, the government adopted this course. If necessary I can forward consular data to verify the correctness of the statement. Again, the most important newspaper in the colony, "De Surinamer" (copy mailed with this), would certainly not comment so favorably on this article which Mr. Lawton claims to be "an injustice to the colony" if it were not a truthful statement of colonial affairs.

Paramaribo, June 24, 1915.

J. B. PERCIVAL.

[The article from the Paramaribo journal mentioned above refers with evident approval to Mr. Percival's letter in THE INDIA RUBBER WORLD and gives no intimation that any of his statements, so sharply criticised by Mr. Lawton in our June number, were incorrect.—Ed.]

EXPORTS OF BALATA AND RUBBER FROM BRITISH GUIANA.

	January 1 to July 15 1914.	1915.
Balata.....pounds	368,969	853,291
To United Kingdom.....		729,189
To United States.....		124,102
Rubber.....	665	1,979

At a meeting of the Board of Agriculture of British Guiana in June it was urged by the Governor of the colony that more enterprise be shown in the planting of large areas of land suitable for rubber cultivation. He stated that rubber could be collected quite cheaply in the colony, but in order to do so the cultivation should be on a large scale, which would reduce the cost of superintendence. To give encouragement to planting, the Board of Agriculture has reduced the price of rubber stumps to \$12 per thousand.

THE RUBBER SITUATION IN BRAZIL.

By Our Regular Correspondent.

THE crisis from which Brazil is still suffering began in the autumn of 1913, when coffee suffered a severe fall in price as rubber already had. The country had become accustomed to an extravagant manner of living, and therefore continued to import expensive foreign luxuries when the value of its exports had enormously decreased. European financiers had too great confidence in Brazil. They overestimated the credit of the country and thus helped it to continue impoverishing itself until the Balkan wars and the Mexican troubles came. The effect of these disturbances on the European money market was felt here in Brazil. European capital was distributed here with noticeably less prodigality. Then, in July, 1914, came the outbreak of the great European war which cut off altogether the supply of foreign gold and accentuated the financial weakness of our country. The crisis was aggravated.

It must be borne in mind that, though Brazil is a very large country, covering an area of some 3,218,130 square miles, its population of about 22,000,000 inhabitants is small for such a great territory, being, in fact, but a fraction more than six people to the square mile. This comparatively small

population has always been in the way of the development of the natural resources of the country. The scarcity of labor makes its cost very high and this fact directly affects the gathering of rubber which for the past twenty years has been the principal resource of the Northern States of Brazil, and which, together with coffee, represents more than three-quarters of the total exports from this country.

The constantly increasing demand for rubber increased its price to such an extent that the Far East became interested. The immense wealth rubber was creating for Brazil led to the development of Malayan rubber plantations and the low cost of labor in the Far East created a competitor who soon produced more rubber than the Amazons. The price of Hard Fine Para, the standard type of Brazilian rubber, reached 12s. 6d. in 1910, but it fell to less than 2s. in 1914. This certainly explains the tremendous decrease in the value of Brazilian exports. The government was aroused and took measures to protect its rubber production, but they had little or no beneficial effect. Then the outbreak of the war in Europe buoyed up the hopes of our despairing rubber gatherers. The unusual conditions created by the outbreak of hostilities caused the price of our Hard Fine Para to rise to 2s. 7d. and it was hoped that old time prosperity would be at least temporarily restored. But this did not happen. The capacity, facilities and the organization of the Far Eastern rubber plantations were too great. Instead of increasing our output of crude rubber we allowed it to decline, the 1914-1915 crop being 6,000,000 pounds or more below the figures for the previous year. An increase in production might have compensated for the decrease in value, but for some reason or other Brazil did not follow the general practice and the crop was materially reduced.

This appears to be a mistake, for the applications of rubber are limitless and a country that can produce excellent rubber in large quantities should be able to hold its own against any competition. The efforts Far Eastern planters are constantly making to reduce the cost of production of their rubber should be to us an indication of the proper course to follow, unless we wish to have to mourn the total disappearance of rubber from among our exports. The forests of the Amazons contain vast reserves of fine rubber trees. The only trouble is the excessive cost of getting this rubber to market—the difficulty of reaching these fine trees, tapping them, converting their latex into crude rubber and getting this to the world's markets. Means of communication are lacking; the donkey's back is a conveyance far too costly under present conditions. The cost of production of our rubber must be materially reduced.

Conditions have already obliged the people to modify their ways of living. The planting of agricultural produce plants has been resorted to, but the results are not yet sufficient to materially relieve the situation. More organization is needed. Means of transportation must be provided. Rubber can no longer support the exorbitant 18 per cent. export duty now collected. Moreover the goods essential for the outfitting of the seringueiros must be subject to more reasonable customs duties. There is no adequate reason or argument for the high customs tariff which affects by 300 per cent. the price of some commodities. There is no reason for protecting industries that do not exist. The adoption of a reasonable tariff, adequate for the protection of the industries actually established in the country and at the same time permitting our rubber industry to survive, is what is needed here. It is doubtful if the government would lose any revenue to speak of, for certainly the effect of a reduction of the tariff would be to reduce the colossal scale upon which smuggling is here carried on.

We cannot reasonably hope for a rubber boom like that of 1910 to come with the re-establishment of peace. Condi-

tions today are quite different and the capacity of Far Eastern plantations is too great to allow of a rubber boom; but the height of our financial crisis was no doubt reached in the autumn of 1914, and we have every reason to believe that the government will help us in organizing our rubber production on some possible basis. The country has been struggling through a terrible crisis. It is now on the road toward health, but the financial situation will continue to be full of difficulties until the natural resources of the country can be organized solidly enough to exercise a beneficial influence on commercial conditions. Rubber is qualified to do more toward this than any other of our exports.

AMERICAN RUBBER MANUFACTURING PLANT IN BRAZIL.

In 1912 the Brazilian government enacted certain laws intended to induce foreign and domestic capital to invest in the establishment of rubber refining plants and rubber goods factories in Brazil. A premium of \$130,000 gold was to be awarded to the first rubber refining plant established in that country, and another premium of \$166,000 gold to the first company establishing, under certain conditions, a rubber manufacturing plant in Manáos, Pará, Pernambuco, Bahia and Rio de Janeiro. Materials and supplies necessary for the construction and complete installation of the factories, and chemical substances, fabrics and various materials necessary for the operation and maintenance of the factories during a term of 25 years, were to be admitted into Brazil free of import duty.

In order to have a right to the premiums, the factories would have to represent an actual investment of capital equal to four times the value of the premiums offered. The company satisfying the requirements and willing to accept the government's offers would have the right of appropriating lands required for the development of the factory. In addition, the government would give the factory preference in purchases of products used in the service of the army and navy and the federal public departments, as soon as the factory could compete in quality with similar foreign products. A Department of "Rubber Defense" (Defesa da Borracha appointed a committee to pass on bids submitted.

Taking advantage of these overtures of the Brazilian government, several companies, foreign and domestic, submitted proposals, among them The Goodyear Tire & Rubber Co. of South America—subsidiary of The Goodyear Tire & Rubber Co. of Akron, Ohio—organized under the laws of the State of Maine, with a capital of \$3,000,000, for the declared purpose of operating rubber plantations and manufacturing rubber in South America. This corporation sent its director to Brazil to investigate conditions and decided on erecting a rubber manufacturing plant in Rio de Janeiro. Credentials presented to the Brazilian Rubber Defense Committee established the company's technical and financial capacity.

The bid of the Goodyear company covered the erection of a modern rubber manufacturing plant at Rio de Janeiro, to consist of ten 3-story buildings covering an area of over 150,000 square feet, to manufacture rubber tires, mechanical goods, combinations of rubber and asbestos, insulated wire, druggists' sundries, waterproof fabrics and different industrial preparations of rubber. The ownership of the real estate and other property involved in the factory was to revert to the Brazilian government in ninety years. The Defesa da Borracha committee accepted the Goodyear proposal, but the Brazilian government was apparently unable to carry out its part of the agreement and the contract remained in abeyance until June last, when it was ratified with some modifications.

A factory will be erected following the lines proposed by the Defesa da Borracha committee, in 1913, as modified by recent proposals made by the Goodyear company. The company relinquishes all its rights to premiums, while the Brazilian govern-

ment loses its right of expropriation. The working of the factory is to begin within three years of the date of ratification of the agreement, and in case of non-compliance with the terms of the contract the company will forfeit whatever real estate it may have acquired and any buildings erected for the use of the factory, as also the security of \$100,000 it deposited. Of course the whole agreement is subject to cases of "force majeure," of which the Brazilian government shall be judge.

THE BRAZILIAN VALORIZATION OF RUBBER.

According to late advices from Rio de Janeiro, the Chamber of Deputies of the Federal Government of Brazil has approved an issue of 350,000 contos (\$90,000,000) paper, the greater part of which is intended for use in financing coffee and rubber.

This valorization scheme was worked out more than a year ago, after the election of the new president, Dr. Wenceslau Braz. It has the approval of all the militant parties of Congress. In fact, the president himself, in his message at the opening of the sessions, recommended this measure as a remedy for the financial depression in Brazil.

A part of the \$90,000,000 is intended for the payment of treasury debts, both gold and paper, prior to 1915; but most of the issue will be deposited in the Bank of Brazil as a fund to make loans to holders of coffee and rubber.

The former valorization schemes, especially that for rubber, proved to be failures, in which the Bank of Brazil lost about \$10,000,000. This gave the actual administration of the bank a lesson as to the means of employing valorization of the products, without the sacrifice of money deposited by the government for this purpose.

The idea is to deposit the products in warehouses. The bank will make loans to the producers up to about 80 per cent. of the value of the day's price, in the case of rubber. Coffee will have another plan of valorization. Thus the producers of rubber will not be forced to sacrifice their product by selling it to the intermediary, the exporter, at a price fixed two or three months before. (Generally the Amazonian rubber is sold for future delivery from two to four months ahead.)

The rubber having been deposited, the producer will offer it to the consuming markets. Receiving a price which will of course be in accordance with the supply and demand, the producer will sell it. This will do away with the actual speculation to which rubber is subject and which is so harmful to both producer and consumer. If by chance the price of rubber goes down, the producer will sell it in the same manner as at present, namely, have it sent to New York or London on consignment and receive 80 per cent. in cash. The only difference will be that the 80 per cent. will be advanced by the bank on the deposit of the rubber, settling the balance when the sale is made, instead of shipping it to the importing market and receiving 80 per cent. from the consignee. If the producer intends to speculate the bank will force him constantly to maintain a margin of 20 per cent. for its protection.

RUBBER IMPORTS FROM VENEZUELA, COLOMBIA AND HONDURAS.

During 1914, rubber exports from the port of Ciudad Bolívar, Venezuela, to the United States, amounted to \$173,959, against \$153,021 exported during the previous year; an increase of \$20,938.

Balata exports from the same port to the United States amounted, in 1914, to \$292,482, as compared with \$220,496 exported in 1913; an increase of \$71,986.

Rubber exports from Colombia to the United States amounted in 1914 to \$89,104, as against \$178,476 during the previous year; a decrease of \$89,372.

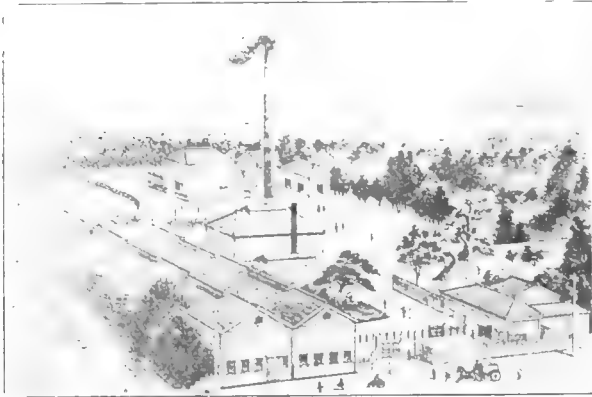
During 1914 Honduras exported crude rubber to the value of \$21,925 to the United States, against \$17,417 during the previous year; an increase of \$4,508.

Growth of the Rubber Industry in Japan.

By a Resident Correspondent.

THE first rubber manufacturing enterprise in Japan was the Mitatsuchi Rubber Co., established in 1880, at Yokohama. Mr. T. Taki, for the manufacture and repair of divers' outfits. Vulcanization processes were but little understood by those in charge. They learned from English books that

ment support during the Chinese-Japanese war [1894-5]. It was not, however, until 1900 that European machinery and methods were generally introduced. This was done by the



VIEW OF JAPANESE RUBBER FACTORY

results were obtainable by means of dry heat and proceeded to build a furnace arranged for burning wood under a pan filled with sand and provided with a close-fitting cover. The goods were placed in the sand and cured, with extreme irregularity, owing to the erratic temperature of the furnace. Seven years later a second rubber company was established, near Osaka and Kobe for the manufacture of rubber water bottles by the cold cure process.



BICYCLE TIRE SHOP.

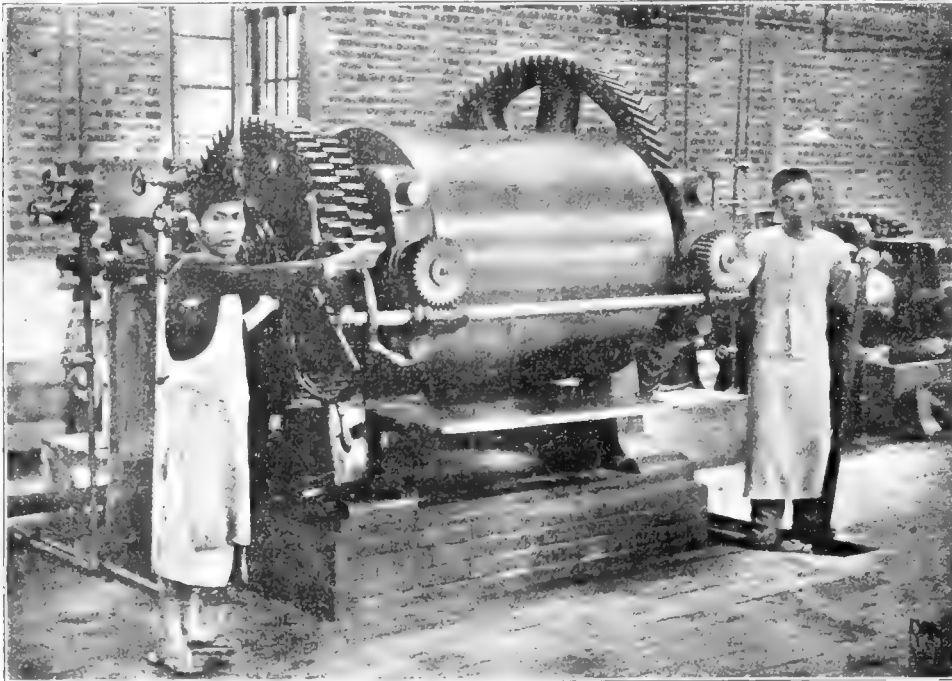
Meiji Rubber Works of Tokio—organized in 1892 as The Tokyo Rubber Co.—under the instruction of an English expert. In that year four new rubber companies were established at Tokio, bringing the total number of Japanese rubber factories up to ten.

In 1908 English capital became interested in rubber manufacture in Japan and The Dunlop Rubber Co. (Far East), Limited, and The Ingram Rubber Co., established factories at Kobe. Since then rubber companies have rapidly increased in number, due to the distribution of practical rubber workers from the older concerns. The lines of manufacture now include tires, belting, hose, mechanicals, footwear, molded shoe soles, proofed cloth, druggists' sundries and dipped goods.

The development of the industry since its establishment in 1880 is shown by the following tabulation, which does not include the small toy balloon factories or repair shops, of which there are many in various parts of the country.

RUBBER COMPANIES IN JAPAN.

Year.	General Rubber Companies.	Insulated Wire Companies.
1880.....	1	0
1890.....	3	2
1900.....	10	2
1905.....	15	3
1910.....	26	6
1911.....	30	7
1912.....	47	7
1914.....	60	8



MIXING MILL IN JAPANESE RUBBER FACTORY

Vulcanization by steam was introduced in 1892 by the Mitatsuchi company, which a year later also began the manufacture of ebonite and suction hose. The industry expanded under govern-

The following table gives the yearly imports of crude rubber since 1910 and of seven other years since 1886, when this commodity was first imported in any quantity:

JAPANESE IMPORTS OF CRUDE RUBBER.

Year.	Pounds.	Value [U. S. Currency.]	Year.	Pounds.	Value [U. S. Currency.]
1886...	1,941	\$489	1905...	729,736	\$422,475
1890...	5,860	866	1910...	1,500,418	1,515,193
1894...	36,166	13,388	1911...	2,054,864	1,530,008
1895...	27,553	11,556	1912...	2,044,010	1,514,560
1900...	107,439	52,159	1913...	2,681,943	1,725,922
1904...	485,255	284,327	1914*	2,305,267	1,973,314

*Decrease due to British embargo.

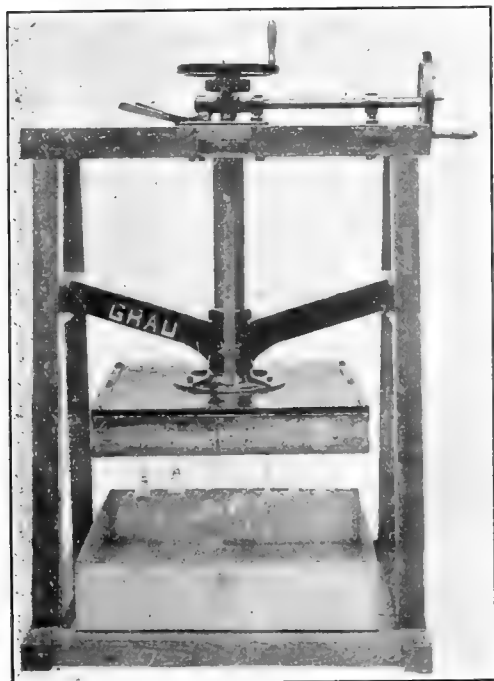
In 1914 the general rubber companies had \$2,500,000 capital and 4,000 workmen



TYPICAL JAPANESE ADVERTISEMENT.

The wire insulating companies had about \$3,000,000 capital and 3,000 workmen.

In addition to the incorporated companies there are hundreds of small plants where toy balloons and other articles are made by hand dipping. The larger companies, however, have dis-



LOAYZA DIPPING MACHINE.

placed this hand work by a machine patented by Francisco A. Loayza, Peruvian Consul at Yokohama. The machine enables the operator to do more and better work. One machine can equal the output of 400 hand workers in the same time.

Japan's imports of rubber goods have also steadily increased since 1886, when they amounted to \$26,862, until 1913, when,

JAPANESE IMPORTS OF RUBBER GOODS.

(Exclusive of submarine and underground cables.)

Year.	Value.	Year.	Value.
1886.....	\$26,862	1905.....	\$1,742,221
1890.....	67,376	1910.....	2,601,762
1894.....	94,593	1911.....	4,307,024
1895.....	154,375	1912.....	4,585,712
1900.....	595,264	1913.....	2,623,026
1904.....	796,599	1914.....	1,025,812

Japanese exports of rubber goods are made mostly to China and Asiatic districts, the value of such imports being, in 1913, \$330,859, in 1914, \$740,063. In addition to which, the annual exportation of toy balloons amounts to about \$30,000.

JAPANESE RUBBER PLANTATIONS.

The Japanese rubber plantations are located in the Ogasawara Island, Formosa and in Malaysia and Borneo. Those in Formosa in 1894 began the cultivation of the vine "Gomu Katsura," but abandoned it in 1904 in favor of *Manihot*, *Hevea* and *Ficus*. The Formosa plantations comprise a total of 35,000 acres. The yield is not as good as that in Malaya, the climate being less favorable. The Japanese plantation area in Malaya totals 95,000 acres, of which 40,000 are cultivated and 1,881 acres yielding. The capital



JAPANESE RUBBER PLANTATION IN MALAY PENINSULA.

invested is \$4,500,000 and it is estimated that \$7,500,000 more will be needed to develop the total acreage.

In Borneo the Japanese have only 1,000 acres in rubber plantations.

The rubber manufacturing plants are at present enjoying excellent business, with special demand for toy balloons, the supply of which in Europe as well as in America has hitherto come largely from Germany.

Japan has a monopoly of the production of the rubber latex cups used in Ceylon and the Federated Malay States, where the demand reaches hundreds of thousands yearly.

LANDOLPHIA RUBBER EXPORTS FROM PORTUGUESE EAST AFRICA.

There was a time when the exportation of *Landolphia* was one of the principal items of the export trade of Mozambique Province, Portuguese East Africa, but it is rapidly becoming impracticable to export rubber from this province on account of the low prices prevailing in European markets. In 1913, though a large decrease in these exports had already occurred, their value still amounted to \$44,665, but in 1914 it only amounted to \$11,075. The supply of *Landolphia* is said to be practically unlimited, but it cannot be gathered profitably unless there is a marked improvement in European prices. Such an improvement is improbable and, at the present rate of decrease the rubber item will soon disappear from the export statistics of Mozambique.

Exports of crude rubber from the Nyassa Co.'s territory in Portuguese East Africa during 1914 amounted to \$18,413.

Recent Patents Relating to Rubber.

UNITED STATES OF AMERICA.

ISSUED JULY 26, 1915.

- N** 1,147,083. Plastic composition for making receptacles. C. S. Dolley, Nelson, N. H.
- 1,147,084. Machine for making insoles. W. Lowley, assignor of one-half to C. H. Krippendorf, both of Cincinnati, Ohio.
- 1,147,085. Treatment of latex. S. C. Davidson, Belfast, Ireland.
- 1,147,086. W. D. McNaull, Toledo, Ohio.
- 1,147,100. Suction supporting device for mirrors. J. G. Knabe, Watertown, S. D.
- 1,147,111. Tire for vehicle wheels. L. J. Marsula, Pittsburgh, Pa.
- 1,147,149. Vacuum tread for tires. W. Dunbar, Greensburg, Pa.
- 1,147,179. Attachment for syringes. C. L. Laffer, Denver, Colo.
- 1,147,252. Method of making tire forming strips. J. T. Lister, Cleveland, Ohio.
- 1,147,283. Tire forming material. J. T. Lister, Cleveland, Ohio.
- 1,147,284. Apparatus for forming rubberized fabric tubes or strips. J. T. Lister, Cleveland, Ohio.
- 1,147,282. Stethoscope. K. M. Finner, Jamaica, N. Y., assignor to General Acoustic Co., New York, N. Y.
- 1,147,470. Anti-skidding device for dual tires. H. D. Weed, Syracuse, N. Y., assignor to W. E. Lashar, Bridgeport, Conn.
- 1,147,560. Massage apparatus. T. and W. Shurtleff—both of Moline, Ill.
- 1,147,563. Mold for the manufacture of rubber tires. T. Sloper, Devizes, England.
- 1,147,600. Tire. J. A. Borland, assignor of one-half to Powel Crosby—both of Cincinnati, Ohio.

Design.

- 47,612. Tire. H. W. Raymond, Portland, Ore.
- ISSUED JULY 27, 1915.
- 1,147,750. Nipple for nursing bottles. M. H. McMann, New York, N. Y.
- 1,147,847. Electric vulcanizers. O. C. Denais, Chicago, Ill.
- 1,147,969. Chuck in printer's blanket. G. Palmer, Chicago, Ill., assignor to G. I. Wilson, New York, N. Y.
- 1,147,977. Cushion tire. H. F. Schless, South Bend, Ind.
- 1,148,146. Slitting and rewinding machine. J. A. Cameron and G. B. Birch, New York, N. Y., assignors to Cameron Machine Co., Brooklyn, N. Y.
- 1,148,162. Bias cutting machine. W. A. Gordon, Shelton, assignor to Birmingham Iron Foundry, Derby, both in Connecticut.
- 1,148,171. Pneumatic core for repairing tires. A. L. Johnson and A. O. Alsten, assignors of one-fourth to H. C. Goulding, and one-fourth to L. A. Alsten, all of Worcester, Mass.
- 1,148,226. Method of manufacture of rubber water bottles. G. E. Hall, Akron, Ohio.
- 1,148,287. Pneumatic tube testing and tire carrying device. J. Closs, St. Ansgar, Iowa.
- 1,148,376. Pneumatic insole. S. S. Gay, Sedro Woolley, Wash.
- 1,148,381. Non offset surface covering for impression cylinders. J. E. Haskins, New York, N. Y.
- 1,148,408. Tire. C. E. Robinson, G. W. Young and J. B. F. Showalter, all of Springfield, Mo.
- 1,148,427. Non-puncturable tire. H. and P. E. Barley—both of Hillsdale, Ore.
- 1,148,476. Weather strip. G. H. Forsyth, Chicago, Ill.

ISSUED AUGUST 3, 1915.

- 1,148,504. Tire armor. R. W. David, Philadelphia, Pa.
- 1,148,566. Brush. T. F. Barry, assignor to Rubber & Celluloid Harness Trimming Co., both of Newark, N. J.
- 1,148,952. Breast pump. H. L. Benen, Brooklyn, N. Y.
- 1,148,953. Facial steamer or bath. G. W. Caldwell, Philadelphia, Pa.
- 1,149,007. Pneumatic tire. L. J. Webster, Haverhill, Mass., assignor to Reliance A. C. Co., Inc., New York, N. Y.
- 1,149,008. Pneumatic tire. L. J. Webster, Haverhill, Mass., assignor to Reliance A. C. Co., Inc., New York, N. Y.
- 1,149,083. Hose supports. H. Ratz, New York, N. Y.

Foreign Patents.

- 66,745. Nathan D. Deane Shoe Co., Newburyport, Mass. A seal with the words *The Current* and *Seal*. For boots and shoes made of leather and rubber, etc.
- 77,564. Milton Ochs, Cincinnati, Ohio. The words *Gold Bond*. For rain-coats, etc.
- 78,641. Charles Nichols & Sons Co., Malden, Mass. Illustration of a tire for tire carrying lengthwise of and incorporated in the fabric. For brush hose.
- 83,350. K. J. Covert Co., Chicago, Ill. The word *Art*. For hose supporters.
- 83,400. Continental Rubber Works, Erie, Pa. The word *Unite*. For rubber hose connections, rubber valves, etc.
- 83,467. F. C. K. Co., Inc., Manufacturing Co., Trenton, N. J. The words *Safe* and *Life*. For rubber hose, rubber belting, etc.

- 83,854. L. H. Gilmer Co., Philadelphia, Pa. The word *Gilmer*. For transmission and conveying belts, etc.
- 84,004. William F. Hirschmann, New York, N. Y. The word *Bangle*. For rubber tobacco pouches, etc.
- 84,722. United Drug Co., Boston, Mass. The word *Readi*. For rain coats, etc.
- 84,784. Bishop Gutta Percha Co., New York, N. Y. Representation of an insulated electrical conductor. For insulated conductors and cables.
- 84,908. Service Motor Supply Co., Chicago, Ill. Illustration of a tire chain with the initials *S M S*. For tire fillers and patches for cementing.
- 85,207. The E. Z. Patch Co., Akron, Ohio. The initials E. Z. For cementing and vulcanizing patches for rubber goods.
- 85,280. William Mann Co., Philadelphia, Pa. The word *Mann's*. For fountain pens, rubber erasers, rubber bands, etc.
- 85,281. William Mann Co., Philadelphia, Pa. The word *Mann's*. For fountain pens, rubber erasers, rubber bands, etc.
- 85,540. Mark Hydes, Newark, N. J. Illustration of a white tree on a black background, with the word *Nichols*. For tree sap or gum of the *Ficus* vine.
- 85,958. Geo. Borgfeldt & Co., New York, N. Y. Illustration including a globe, a child and animals. For molded and decorated rubber toys, etc.
- 86,027. Bloomingdale Rubber Co., Butler, N. J. The word *Pahvan*. For reclaimed rubber.
- 86,137. The Helmet Co., Cincinnati, Ohio. The word *Roundees*. For chewing gum confection.
- 86,199. Bishop Gutta Percha Co., New York, N. Y. Illustration of an Indian's head in a circle. For sheets or strips of gutta percha of tissue-like dimension.
- 86,365. Druggists' Supply Corporation, New York, N. Y. The words *Rubber-Kite*. For rubber face bottles, water bottles, syringes, etc.
- 86,404. The Omo Manufacturing Co., Middletown, Conn. The words *White Clover*. For dress shields.
- 86,462. The Whitney Blake Co., New Haven, Conn. A diamond shaped design with the initials *H B*. For insulated wire and cables.
- 86,467. Akron Tire Co., Inc., New York, N. Y. The word *Hercules*. For rubber vehicle tires.
- 86,520. The Mechanical Rubber Co., Jersey City, N. J. The word *Parad*. For sheet packing composed of rubber or rubber combined with fabric and metal.
- 86,608. De Cou Brothers Co., Philadelphia, Pa. The words *De Cou Bros*. Co. so arranged as to form a shoe. For footwear made of rubber, etc.
- 86,627. United States Rubber Co., New Brunswick, N. J. The word *Fabrikhyde*. For rubber soled boots and shoes with canvas tops.
- 86,910. Mishawaka Woolen Manufacturing Co., Mishawaka, Ind. The word *Himmer*. For footwear of rubber and rubber combinations.
- 86,930. Eagle Pencil Co., New York, N. Y. The word *Princeess*. For fountain pens.
- 86,931. Eagle Pencil Co., New York, N. Y. The word *Princeess*. For fountain pens.
- 87,088. Pioneer Suspender Co., Philadelphia, Pa. The word *Diam p'd*. For garters.

ISSUED AUGUST 10, 1915.

- 1,149,171. Insulating varnish. C. Baeder, Hoboken, N. J.
- 1,149,224. Machine for reinforcing hose. S. L. Sill, assignor of one-half to H. H. Hewitt, both of Buffalo, N. Y.
- 1,149,271. Elastic waistband for trousers. A. Lazarus, New York, N. Y.
- 1,149,348. Ruling fountain pen. G. C. Eggers, Bovill, Idaho.
- 1,149,364. Method of making pneumatic tires. R. Griffith, assignor to Miller Rubber Co., both of Akron, Ohio.
- 1,149,459. Automobile tire. E. J. Mitchell, Brooklyn, N. Y.
- 1,149,577. Caoutchouc substance and process of making same. K. Gottlob, Elberfeld, Germany, assignor to Farbenfabriken vorm. Friedr. Bayer & Co.
- 1,149,580. Caoutchouc substance and vulcanization product thereof. F. Hofmann, Elberfeld, and K. Gottlob, Vohwinkel, near Elberfeld, Germany, assignor to Synthetic Patents Co., New York, N. Y.
- 1,149,640. Cushion tire. H. E. Edwards, Warren, Ohio.
- 1,149,664. Hose construction. R. Many, Oak Park, Ill.
- 1,149,674. Detachable sleeve and rubber armband therefor. P. J. Nichols, Walsenburg, assignor of one-sixteenth each to W. H. Doyle and H. Olsen, Telluride, both in Colorado.
- 1,149,749. Detachable tire tread. C. B. Gray, Gloversville, N. Y.
- 1,149,780. Quick detachable elastic tire. P. A. Painchaud, Plessisville, Que., assignor to J. Paré and O. Gingras, Quebec—both in Canada.
- 1,149,782. Automobile tire. W. M. Peabody, Chicago, Ill.
- 1,149,841. Cover for pneumatic tires. R. Latour and A. Cappelle, Menin, Belgium.
- 1,149,849. Rubber hand stamp. T. O. Matthews, assignor to Jas. H. Matthews & Co., both of Pittsburgh, Pa.
- 1,149,853. Roller apparatus for masticating plastic and like materials. J. H. Nuttall, Manchester, England.
- 1,149,897. Fabric containing india rubber. A. T. Collier, St. Albans, England.

- 1,149,950. Rubber coated protective apron. H. P. Rindskopf, New York, N. Y.
 1,149,971. Rectal generator. J. B. Wagener, deceased, Los Angeles, by Alma M. Wagener, administratrix, San Francisco, both in California.

Life Malt

- 79,355 Colchester Rubber Co., Colchester, Conn., assigned to United States Rubber Co., New Brunswick, N. J. The word *Life* over a crown design. For rubber boots and shoes.
 84,375 L. P. Larson, Jr., Chicago, Ill. The word *Pettinunt* in a rectangular design. For chewing gum.
 86,351 C. P. Landrith, Philadelphia, Pa. The word *Kick*. For rubber belting.
 86,472 Geo. Borgfeldt & Co., New York, N. Y. The letters *R. E.* and the words *Rubber and Elastic*. For rubber and other toys.
 86,621 The Republic Rubber Co., Yonkersville, Ohio. The word *Indur*. For elastic chewing toys.
 86,724 A. H. Burt, Buffalo, N. Y. The word *Burt* and the letter *B* in banner design. For chewing gum, etc.
 87,376 Hood Rubber Co., Watertown, Mass. The word *Kick*. For tennis shoes with canvas top and rubber sole.
 87,326 American Hard Rubber Co., New York, N. Y. The word *Hard*. For syringes.
 87,500 Hershey Chocolate Co., Hershey, Pa. The word *Hershey*. For chewing gum.

UNITED KINGDOM.

PATENT SPECIFICATIONS PUBLISHED.

The number given is that assigned to the Patent at the filing of the application, which in the case of these listed below was in 1914.

**Denotes Patent for American Intentions.*

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, JULY 14, 1915.]

- *6,717 (1914). Life saving suit. J. Scarlett, Fourth avenue and Pine street, Seattle, Wash., U. S. A.
 6,763 (1914). Vulcanizing india rubber. W. I. Mellersh-Jackson, 28 Southampton Buildings, London.
 6,766 (1914). Hard rubber protecting pieces for edges of closet and lavatory basins, etc. Spezialfabrik für Gesundheits-Technische Einrichtungen E. Katzenberger, 11 Bothmerstrasse, Munich, Germany.
 6,824 (1914). Conveyor belt of balata, etc. W. H. Baxter, 71 Gilded Road, Leeds.
 *6,841 (1914). Life saving suit. C. J. Fril, Stege, Cal., U. S. A.
 *6,842 (1914). Surgical syringe or irrigator. J. A. Speck, 465 N Twelfth street, Salem, Ore., U. S. A.
 6,914 (1914). Shampooing appliance. T. J. Jay, 2c Portman Mansions, London.
 6,973 (1914). Administering anaesthetics. A. Humphries, Browning street, Napier, New Zealand.
 6,994 (1914). Rubber in mud guard. E. D. House, 33 Black Horse Road, Kingswood, Bristol.
 7,003 (1914). Breathing apparatus. W. I. Mellersh-Jackson, 28 Southampton Buildings, London.
 7,002 (1914). Rubber spoke brush. W. Turner, 8 Philip Road, Peckham Rye, London.
 7,005 (1914). Abdominal belt. P. A. E. Faure, 3 Rue Mucron, Toulouse, France.
 7,048 (1914). Wire covering machine. N. Stott, "Sunnyside," Cavenish Road, Peckers, Lancashire.
 7,075 (1914). Machine with vulcanite surface for drying and finishing laundry goods. A. M. D'Orsey, 34 Dennington Park Road, West Hampstead, London.
 7,087 (1914). Metallic paint comprising rubber solution. British Patent Syntite Co., and E. G. Meadow, 40 Trinity Square, London.
 7,111 (1914). Cracking oils. Continental Caoutchouc & Gutta Percha Compagny, Hanover, Germany.
 7,115 (1914). Teat cup for pneumatic milking machine. H. O. Backman, 96 Boulevard de la Senne, Brussels.
 7,185 (1914). Wearing apparel. F. Barth, 151 Rudolfstrasse, Bamberg, Germany.
 *7,226 (1914). Tire braiding machine. W. H. Dunkerley, 143 Crooks avenue, and T. J. Arnold, 373 Broadway both in Paterson, N. J., U. S. A.
 7,300 (1914). Rubber segments in detachable rim attachments to wheels. T. Gatt, 27 Thurlby Road, Wembley, Middlesex.
 7,271 (1914). Elastic sleeve supporter. B. Lincke, 15 Brockhausstrasse Leipzig, Germany.
 *7,289 (1914). Wheel tire. C. H. de Vull, 1374 Dearborn avenue, Chicago, Ill., U. S. A.
 7,288 (1914). Air tubes for wheel tires. D. J. Chappell, 21 Sarsse Road, Blanelly, Carmarthenshire.
 7,299 (1914). Making hollow rubber articles. R. Daeschner, 9 Koenigsstrasse, Passau, near Munich, Germany.
 7,310 (1914). Rubber projectile for toy firearm. Firm of B. Ullrich, 13 Wanderstrasse, Nurnberg, Germany.
 *7,314 (1914). Braiding machine. W. H. Joslin, P. O. Box 1231, Providence, R. I., U. S. A.
 7,344 (1914). Medical irrigator. G. N. Clark, 53 Chancery Lane, London. Meinecke & Co., 48 Park Place, New York, U. S. A.
 7,370 (1914). Vulcanizing india rubber. S. I. Peachey, 8 Halesden Road, Heaton Chapel, near Stockport.
 7,375 (1914). Horse-shoe with rubber pads. E. C. Purdue, Easthamstead, Bracknell, Berks.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, JULY 21, 1915.]

- 26,501 (1913). Corset with girdle or extensible material. H. Sefton-Jones, 285 High Holborn, London.
 21,383 (1913). Nasal douche. H. Sefton-Jones, 285 High Holborn, London.
 1,479 (1913). Diving dress. A. B. Dräger, and Drägerwerk H. & B. Dräger AG, 453 Maschinger Allee, Lubbeck, Germany.
 7,386 (1914). Dress shield. M. Heilmann, 61 Rottstrasse, Berlin.
 7,601 (1914). Double fountain pen. A. Balazs, 410 East 120th street, New York City, and C. Schlesinger, 191 44th street, Corona, N. Y., U. S. A.
 7,607 (1914). Tire cover or rubber. J. Lohde, 174 St. Vincent street, Glasgow.
 7,609 (1914). Gutter. F. G. Heath, St. George's Works, Brimfield Road, Headless Cross, Rotherhithe.
 7,610 (1914). A hole wheel with rubber and other tire. F. W. Bush, The Elms, Golden avenue, Peterborough.
 7,609 (1914). Felling for shoe soles. C. J. Morris, 49 Princes Road, Holland Park; A. B. Cross, 28 Cardine Place, Bayswater, and W. Percy, 22 Connaught street, Paddington all in London.
 7,604 (1914). Medical syringe. J. Kelly, 48 Hockley street, London.
 7,608 (1914). Clearing falls. J. A. Harter, 45 Biddle street, Manchester.
 7,606 (1914). Tire cover. H. Koles, Pneumatik Werke Ges., 10 Fiedrichstrasse, and G. Meier, 69 Hatten both in Bremen, Germany.

- 7,600 (1914). Tire cover reinforced with hard rubber rings. F. Newbauer, Valley City, N. D., U. S. A.
 8,001 (1914). Abrading rubber sheet, ribbon or strip. J. E. Blaisdell, 60 St. James' street, Westminster.
 8,003 (1914). Winding strip rubber for making elastic tires. J. E. Blaisdell, 60 St. James' street, Westminster.
 8,004 (1914). Measuring resistance. J. E. Blaisdell, 60 St. James' street, Westminster.
 8,154 (1914). Tire fabric. G. F. Heal, King's House, Kingsway, London.
 8,008 (1914). Toilet appliance. J. Stock, Pilsen, Bohemia.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, JULY 28, 1915.]

- 8,334 (1914). Rubber buffers or protectors for furniture. C. Mason, 11 Tynning Terrace, Ladbroke Road, Bath.
 8,334 (1914). Brush with bristles set in rubber. W. I. B. Hinde, 5 Great Queen street, Kingsway, London.
 8,405 (1914). Application of rubber to a clamping machine. H. Robinson, Albert House, Wellington Road, and C. H. N. Walsh, 24 Corporation Road both in Foles and S. Redfern, 12 Swan Court, Market street, Manchester.
 8,411 (1914). Tire repairing material. F. W. Larr, 30 Bridge street, Northampton.
 8,408 (1914). Attaching dolls' heads, etc., by rubber cord. L. Rees, 46 Baughall street, London.
 8,486 (1914). Infants' rubber comforts. A. S. Morrison, 26 Duke street, Abinger, London.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, AUGUST 5, 1915.]

- 8,764 (1914). Elastic band for cuff and sleeve supporter. H. J. Bruckmann, 4 Schillerstrasse, Stettin, Germany.
 8,813 (1914). Rubber reinforcing strips in golf clubs, polo and croquet mallets, etc. P. A. Altman and Buchanan, Limited, 15A Pall Mall, London.
 8,897 (1914). Teats for infants. H. Ruchelberg, 24 Augusta Strasse, Cassel, Germany.
 8,948 (1914). Reservoir pens. P. Cross, 34 Spencer Road, Wardsworth, Comm in London.
 8,976 (1914). Soft ball for golf practice. H. L. Martin, Bishers Streetford Hospital, Herts.
 9,066 (1914). Coagulating inba rubber. R. C. Linton, 68 Woodlands Road, and D. A. Macdonald, 93 Gope street both in Glasgow.
 9,129 (1914). Vulcanite device for face braces. H. E. Samuel, 6 Victoria Place, and C. J. Lindin, 14 Carlton Chambers, High street both in Newport, Monmouthshire.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, AUGUST 11, 1915.]

- 9,068 (1914). Boot, etc. F. A. N. L., 7-1 New York Life Building, St. Paul, Minn., U. S. A.
 9,107 (1914). Mosquito cloth with rubber tesserae. Bertrams, Limited, and R. I. Colson, 101 St. Katherine's Works, Seimens, Edinburgh.
 9,100 (1914). Medical syringe. L. I. Perci, 105 College avenue, Somerville, Mass., U. S. A.
 9,100 (1914). Billiard table cushion. R. G. Lyles & Watts, and J. R. Abbott, 19 S. S. Street, London.
 9,100 (1914). Abdominal belt. W. G. Hoss, 51 Deansgate Arcade, Manchester.
 9,100 (1914). Waterproof apron or suit for children. L. H. Waddington, Sudhall, and F. H. C. S. Wadsworth both in Cleveland, Somersetshire.
 9,100 (1914). Plastic composition comprising vulcanizing rubber, gutta balata, rubber waste, etc. J. S. Campbell, 3 St. James' street, Piccadilly, London.
 9,423 (1914). Stacking suspension. J. H. Wray, 19 Water Lane, Great Tower street, London.
 9,554 (1914). Electric cable insulation. C. J. Beaver, Rangemoor, Crescent Road, Hyde, and J. A. Clement, Bloom Cottage, High Leigh both in Cheshire.
 9,576 (1914). One piece rubber car. A. Laubson, 13 Grosse Bleichen, Hamburg, Germany.
 9,590 (1914). Vehicle wheel. J. Straker, 110 Saccharstraat, Amsterdam.

- 1,111,111. Machine for making lines of constant width. C. Schlenker, 44, Kottbuscher Ufer, Berlin.
- 1,111,112. Machine for making lines of constant width. C. Schlenker, 44, Kottbuscher Ufer, Berlin.
- 1,111,113. Machine for making lines of constant width. C. Schlenker, 44, Kottbuscher Ufer, Berlin.
- 1,111,114. Machine for making lines of constant width. C. Schlenker, 44, Kottbuscher Ufer, Berlin.
- 1,111,115. Machine for making lines of constant width. C. Schlenker, 44, Kottbuscher Ufer, Berlin.

NEW ZEALAND.

[AS PUBLISHED IN THE PATENT OFFICE JOURNAL, JUNE 24, 1915.]

- 33,116 (1915). Milking machine teat cup. J. Paterson, TeAroha, and C. F. Wolfe, Waitoa, both in New Zealand.
- 2,064 (1915). Leather and rubber tires for pneumatic wheels. J. B. Salmon, Filkoul street, Dunedin, New Zealand.

[AS PUBLISHED IN THE PATENT OFFICE JOURNAL, JULY 8, 1915.]

- 36,143. Puncture-proof pneumatic tire. J. A. Shearer, Methuen street, Prospect, S. A.

THE GERMAN EMPIRE.

PATENTS ISSUED (With Date of Validity).

- 286,408 (December 25, 1913). Belt guide for tapered belt pulleys. Ferdinand Wiss, Vallenlar-on-the-Rhine, and Ernst Welf, Bingen-on-the-Rhine.
- 286,696 (June 26). Vehicle tire with elastic lining material and attaching struts. Rudolf Keller, 16 Langestrasse, Stuttgart, and Anton G. Koppe, 47 Varrentrappstrasse, Frankfurt-on-the-Main.

THE FRENCH REPUBLIC.

Patents Issued (With Dates of Application).

- 475,531 (July 31, 1914). Suspenders. A. Fidon.
- 475,538 (July 22). Apparatus for vulcanizing solid rubber tires. A. W. Gislou.
- 475,564 (July 22). Improved detachable vehicle wheel. C. W. Pride.
- 475,565 (July 22). Process for making rubber. J. Ostromislinsky.
- 475,570 (July 22). Pneumatic wheel. A. Brichot.
- 475,601 (July 23). Process for making an elastic substance identical or similar to vulcanized rubber. J. Ostromislinsky.
- 475,622 (July 24). Garter. Miss A. L. Thomas.
- 475,656 (July 25). Anti-skid arrangement for vehicle wheels. J. Kopecky.
- 475,681 (July 25). Injector bulb. E. Vaillat and H. Rose.
- 475,714 (July 27). Nipple. Société des Etablissements Bogner et Burnet.
- 475,753 (July 28). Spare or emergency tire for automobiles and similar vehicles. S. C. Rand.

[NOTE.—Printed copies of specifications of French patents can be obtained from R. Bobet, Ingénieur-Conseil, 16 avenue de Villiers, Paris, at 50 cents each, postpaid.]

RUBBER IN FORD CARS.

LIKE most automobiles, Ford cars are provided with rubber pneumatic tires, rubber floor matting; all their wiring is insulated with rubber; lights and spark are commutated by a hard rubber switch; the tire pump is provided with a rubber hose; the horn is sounded by means of air forced to it from a rubber bulb through a rubber hose and the water jackets of the motor are connected with the radiator by means of heavy rubber tubes. This comprises all the rubber included in the standard equipment of the Ford car. Though the rubber in this standard equipment of the Ford is less per car, perhaps, than in the average automobile of other makes, it represents enormous quantities of rubber when we consider the fact that the production of Fords this year exceeded 330,000 cars.

But the above standard equipment in no sense includes all the current applications of rubber to the "universal car." In Fords, as in all modern motor cars, foot control plays an important part. In the Ford there are three pedals on which foot pressure is almost continuous, especially in heavy traffic. These soon wear smooth, and to prevent their feet from slipping on the pedals, drivers use rubber pedal pads molded from pliable rubber with deep corrugated ribs, assuring a firm grip for the foot. They are provided with metallic clasps and fit snugly over the controlling pedals.

The corrugated steel running boards of Ford cars also soon wear smooth and become slippery. Here again rubber in the shape of corrugated matting solves the problem of making these running boards safe to tread upon in all kinds of weather. A rubber weather strip attached to the bottom rail of the windshield makes the lower half of the latter both wind and rain-proof. Rubber plugs or inserts stop the disagreeable rattle of the doors.

Many owners wish to preserve the cushions and add to the appearance of their cars. For this purpose the market offers them waterproof, rubberized mackintosh seat covers which, to complete the equipment should be accompanied by a top hood cover made of rubber drill or of mackintosh fabric, and a cover of the same material for the back of the seat. A hard rubber radiator cap with instrument indicating cooling water temperature adds to the completeness of one's Ford. Electric cigar lighters enclosed in a hard rubber body and controlled by a hard rubber electric push button are convenient for smokers, while hard rubber enamel makes a rich finish for the steering wheel, which may also be protected by a rubber slip cover. In the summer time when dust and gnats are flying about, goggles are necessary. One of the neatest and lightest types of goggles has a frame made of zylonite—a celluloid and rubber composition.

A prudent Ford driver never ventures on the road without a complete set of tools and some spare parts and emergency helpers, such as extra inner tubes, extra casings, a tire reliner, Now-out patches, patching cement for both casings and inner tubes, vulcanizing cement, tire cut fillers and other articles produced by the rubber industry. As the Ford is a big consumer of water it is prudent to carry a folding water pail, and the best of these are made of heavy rubberized waterproof duck. Owners of Ford cars who do not use their machines during the winter months should cover them with water and dust-proof auto covers made of rubber cloth.

Estimating at \$45.00 the value of the rubber goods entering into the standard Ford equipment, the 330,000 cars produced by the Ford Motor Co. in 1915, would represent \$14,850,000 worth of manufactured rubber. By providing the Ford car with all the existing accessories containing rubber, the value of the rubber goods on each car would be increased to \$100 or \$33,000,000 for the 1915 Ford production. Of course the average Ford owner does not furnish his car with any such equipment and it would be safe to say that the average Ford car in daily use does not carry more than \$60 worth of equipment, of which rubber is a component part. Still, in view of the Ford company's enormous production, this would represent an annual expenditure of \$19,800,000 for rubber equipment.

IMPORTS OF CRUDE AND MANUFACTURED RUBBER AT THE PORT OF NEW YORK

THE QUANTITY IS GIVEN IN PACKAGES.

Year Ending	India Rubber		Rubber Waste.		Rubber Manufactures.		Substitutes.		Chicle.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
1914, 1915	7,111	\$2,093,144	460	\$4,535	62	\$9,706	14	\$1,167	50	\$3,176
1915, 1916	2,492	3,026.5	342	6,072	40	4,430	17	700	4,833	464,899
1916, 1917	1,664	3,788.86	145	2,862	103	15,953	...	...	94	5,633
1917, 1918	12,411	898,763	40	3,7	11	3,312	...	...	17	3,356
July 31	23,673	1,981,137	525	1,193	74	7,725	...	...	114	3,177
Aug. 31	25,603	1,879,681	388	11,948	127	25,083	...	...	490	84,723
Sept. 30	...	7,725.43	...	3,654	35	6,485	...	...	...	...

Review of the Crude Rubber Market.

NEW YORK.

AUGUST 31, 1915.

THE local market for August was generally quiet as a matter of fact almost stagnant. Only the small manufacturers seemed to be in the market; however, a few large orders for spot and future delivery were reported.

Early in the month First latex was quoted at 62 cents for spot in a dormant market and the situation continued with varying fluctuations of a cent to a cent and a half, until August 25, when the price broke to 59½ cents. Later in the week the price stiffened and First latex was quoted at 60 cents.

Pará sorts failed to receive serious attention from buyers. Upriver fine, spot, sold from 58½ cents at the first of the month to 56½ cents on August 28.

The New York imports of crude rubber for July were 7,570 tons, against 4,731 tons for June. July arrivals were divided as follows: Pará (Brazil), 1,378 tons; Pará (Europe), 78 tons; Plantation (London and Liverpool), 3,025 tons; Plantation (Singapore and Colombo), 2,189 tons; African, 379 tons; Manicoba, 68 tons; Centrals, 131 tons; Guayule, 322 tons. For the first two weeks of August the New York imports were 46,440 cases, valued at \$3,607,224.

The receipts from Pará and Manáos to date are reported to be 400 tons in excess of the arrivals for the same period a year ago. The Booth Line steamship "Denis" is afloat from Pará and Manáos with 240 tons. The Lloyd Brasileiro steamship "Sao Paulo" is due from Pará with 260 tons.

LONDON.

The rubber position early in the month of August was firm but with very little actual business to record. Deliveries were being made in excess of receipts. The July figures are 4,447 tons imported and 5,524 tons delivered, against 4,689 tons imported in June and 5,425 tons delivered.

Reports from the East indicate a much greater production for July than a year ago and the indications are that the Brazilian crop will be moving much earlier this season. It would seem, therefore, that we can reasonably look forward to ample supplies of crude rubber for the present and near future. Stocks at the end of July were 4,817 tons, against 3,242 tons in 1914. Spot prices for Standard crepe were 2s. 5¾d. early in the month and closed around 2s. 4½d. on the 26th instant.

For the fiscal year ending June 30, 1915, the india rubber imports for the United States were 76,816 tons, as compared with 58,926 tons for the same period in 1914. Notwithstanding the British embargo there was an increase of 17,890 tons for the current year.

NEW YORK QUOTATIONS.

Following are the quotations at New York one year ago, one month ago, and August 31, the current date:

PARÁ.	Sept. 1, '14.	Aug. 1, '15.	Aug. 31, '15.
Upriver, fine, new...	75 @80	60 @60½	57 @
Upriver, fine, old...		61 @63	58 @
Islands, fine, new...	65 @70	51½ @52	50½ @
Islands, fine, old...		55 @56	52 @53
Upriver, coarse, new	55 @60	44 @	43 @
Upriver, coarse, old			43½ @
Islands, coarse, new	45 @	28 @	27 @28
Cametá	40 @	31 @	28½ @29
Caucho, upper	50 @	45½ @	42½ @43
Caucho, lower		43 @	40 @41

PLANTATION HEVEA.

Smoked sheet ribbed	75 @80	{ Spot... 62 @.	58½ @59
		{ Nearby 61½ @	58½ @
First latex crepe...	70 @75	{ Spot... 63 @	59 @60
		{ Nearby 62½ @	58½ @59
Fine sheets and biscuits, unsmoked...	70 @75	60 @	57 @58

CENTRALS.

Corinto	50 @	43½ @	40 @
Esmeralda, sausage	45 @	42½ @	40 @
Nicaragua, scrap...	40 @	42 @	38 @39
Mexican, scrap	45 @	42½ @	40 @41
Manicoba, scrap		37 @38	35 @40
Mangabeira, sheet		38 @	35 @40
Guayule	55 @	34 @35	32 @33
Balata, sheet	62 @64	55 @56	55 @56
Balata, block		47 @48	45 @47

AFRICAN.

Lopori, ball, prime...	53 @54	53 @54	
Upper Congo, ball, red			51 @53
Massai, red	75 @85	52 @53	50 @52
Soudan Niggers	36 @46		
Cameroon, ball			44 @
Benguela		33 @	31 @
Accra, flake		22½ @	23 @23½
Rio Nunez Niggers		55 @	52½ @53
Konakry Niggers		53 @	51 @52
Gold Coast, lump		27 @	

EAST INDIAN.

Assam		44 @48	42 @
Pontianak	9 @	7¼ @7½	6¾ @7
Gutta Siak		12½ @14	12½ @14
Borneo II			30 @
Gutta Percha		.50 @1.50	2.00 @2.50

New York.

In regard to the financial situation, Albert B. Beers (broker in crude rubber and commercial paper, No. 68 William street, New York) advises as follows: "Our report for July regarding commercial paper in the rubber line covers the conditions for August, the best names being taken freely at 4¼ per cent., and those not so well known, 5½ per cent."

NEW YORK PRICES FOR JULY (NEW RUBBER).

	1915.	1914.	1913.
Upriver, fine	\$0.59 @ 0.63	\$0.68 @ 0.75	\$0.84 @ 0.92
Upriver, coarse	.44 @ .47	.40 @ .42	.51 @ .56
Islands, fine	.52 @ .54	.57 @ .60	.74 @ .81
Islands, coarse	.28 @ .30	.27 @ .30	.29 @ .34
Cametá	.31 @ .32	.30 @ .34	.37 @ .40

United Kingdom.

IMPORTS OF RUBBER.

From—	July.	July.	July.	Seven months ending July.	Seven months ending July.	Seven months ending July.
	1913.	1914.	1915.	1913.	1914.	1915.
Dutch East Indies.....tons	...	...	249	...	...	1,542
French West Africa.....	41	10	66	788	214	388
Gold Coast.....	32	19	21	601	213	162
Other Countries in Africa..	...	...	302	...	...	1,680
Peru.....	50	69	18	747	536	602
Brazil.....	827	592	847	11,341	9,098	8,353
British India.....	...	...	53	...	...	819
Straits Settlements.....	974	1,774	1,621	8,068	11,190	18,748
Federated Malay States....	737	625	864	5,403	5,719	7,205
Ceylon and Dependencies...	384	612	385	3,108	4,176	8,317
Other Countries.....	1,828	1,232	133	11,288	9,367	1,226
Total.....	4,873	4,933	4,559	41,344	40,513	49,042

EXPORTS OF RUBBER.

To—	July.	July.	July.	Seven months ending July.	Seven months ending July.	Seven months ending July.
	1913.	1914.	1915.	1913.	1914.	1915.
Russia.....tons	391	363	306	3,929	4,119	6,544
Germany.....	695	1,172	...	6,315	6,781	...
Belgium.....	143	172	...	1,134	1,351	...
France.....	392	554	788	2,800	4,132	4,005
United States.....	1,421	958	3,733	9,325	13,992	25,490
Other Countries.....	229	367	711	2,159	2,446	5,073
Total.....	3,271	3,586	5,538	25,662	32,821	41,112

Singapore.

Guthrie & Co., Ltd., report [July 7, 1915]:
 Advice received from London during the past few days have indicated a much better tone in the rubber market and this was reflected at the Auction held today, some quite exceptional prices being paid. Pride of place was occupied by fine pale crepe, the price of \$142 touched

... week's best. Bidding for this grade ... were eagerly snapped up. ... up to \$140, an increase of \$8. ... an un-smoked sheet at \$126 was \$3 better ... off freely at an average increase of about ... demand, showing an improvement of \$4. ... of which 140 tons were sold. ... the course of values.

	In Singapore, Pencil	Sterling equivalent per pound in London.	Equivalent per pound in cents.
Smoked 1330	\$135 a 140	2 7/8 a 2 8/8	63.60 a 65.62
Smoked 1330 good ribbed	129 a 134	2 6/8 a 2 7/8	61.06 a 63.09
Sheet, plain, smoke 1	124 a 130	2 5/8 a 2 6/4	58.79 a 61.31
Sheet, unsmoked 1	121 a 126	2 4/8 a 2 5/2	57.52 a 59.80
Sheet, unsmoked 2	134 a 142	2 7/8 a 2 8/4	63.09 a 66.39
Sheet, good 1	138 a	2 5/8 a	60.56 a
Sheet, fine brown	127 a 132	2 5/8 a 2 6/4	60.05 a 62.33
Sheet, 2nd brown	121 a 126	2 4/8 a 2 5/2	57.52 a 59.80
Sheet, dark 1	116 a 124	2 3/8 a 2 4/5	55.49 a 58.79
Sheet, dark 2	117 a 118	2 1/2 a 2 3/4	51.70 a 56.25
Sheet, virgin 1	97 a 102	1 11/8 a 2 0/8	47.38 a 49.41
Sheet, pressed 1	107 a	2 0/8 a	49.41 a
Sheet, 108	80 a 90	1 7/8 a 1 11/8	40.04 a 46.87

Pencil 1330 pounds.

Quoted in S. S. dollars = 2/4 [56 cents].

Plantation Rubber from the Far East.

EXPORTS OF CEYLON GROWN RUBBER.

From January 1 to July 19, 1914 and 1915. Compiled by the Ceylon Chamber of Commerce.)

To	1914.	1915.
Great Britain	8,273,621	12,992,554
United States	4,615,746	7,933,921
Holland	2,686,091	.....
Germany	271,761	.....
Australia	277,456	346,457
France	205,180	23,072
Japan	199,640	208,089
India	98,482	332,700
Strait Settlements	40,252	119,933
Italy	550	500
Italy	312	.....
Canada	.....	340,146
Total	17,368,591	21,596,866

(Same period 1913, 11,741,284 pounds; same period 1912, 5,937,788.)
The export figures of rubber given in the above table for 1914 include the imports re-exported. (These amount to 1,685,991 pounds.) To arrive at the total quantity of Ceylon rubber exported for that period deduct these imports from the total exports. The figures for 1915 are for Ceylon rubber only.

PARA RUBBER VIA EUROPE.

July 26.—By the <i>Maracaibo</i> —Ciudad Bolívar	
G. Amsinck & Co. (Fine)	25,000
G. Amsinck & Co. (Coarse)	30,000
July 26.—By the <i>Paraná</i> —Ciudad Bolívar	
G. Amsinck & Co. (Fine)	18,000
G. Amsinck & Co. (Coarse)	2,000
W. R. Grace & Co. (Fine)	30,000
August 6.—By the <i>Paraná</i> —Colon	
Neuss, Hessel & Co. (Fine)	6,000
W. R. Grace & Co. (Fine)	38,000
W. R. Grace & Co. (Coarse)	3,000
August 9.—By the <i>Paraná</i> —Colon	
G. Amsinck & Co. (Fine)	10,500
August 13.—By the <i>Maracaibo</i> —Ciudad Bolívar	
Schutte, Bunemann & Co. (Fine)	30,000
Schutte, Bunemann & Co. (Coarse)	30,000
Yegorov, Lobo & Co. (Fine)	20,000
August 14.—By the <i>Paraná</i> —Colon	
Mecke & Co. (Cauchó)	41,200

CENTRALS.

July 6.—By the <i>Paraná</i> —Port Limón	
A. Held	500
A. A. Lind & Co.	700
July 8.—By the <i>Camagney</i> —Mexico	
Graham Hinkley & Co.	3,500
H. Marquardt & Co.	1,500
L. S. Schindler & Co.	1,000
Harberger & Stock	1,000
July 9.—By the <i>Paraná</i> —New Orleans	
E. Steiger & Co.	40,000
July 10.—By the <i>Paraná</i> —Mexico	
American Trading Co.	3,500
General Export & Commission Co.	1,000
L. A. M. & Co.	1,000
H. M. & Co.	200
H. M. & Co.	300
July 11.—By the <i>Paraná</i> —Port Limón	
L. S. Schindler & Co.	700
L. S. Schindler & Co.	3,000
August 1.—By the <i>Paraná</i> —Colon	
G. Amsinck & Co.	65,000

August 2.—By the <i>Adriatic</i> —Colon	
G. Amsinck & Co.	50,000
Pablo, Calvet & Co.	3,500
A. M. Capen's Sons	1,500
Lanman & Kemp	1,000
Piza, Nephews & Co.	3,500
L. S. Sambrida & Co.	500
Franque Bros.	500
August 2.—By the <i>Maracaibo</i> —Mexico	
E. Steiger & Co.	500
August 3.—By the <i>Paraná</i> —Colon	
A. Held	500
Isaac Brandon & Bros.	1,500
August 4.—By the <i>Paraná</i> —Colon	
G. Amsinck & Co.	1,500
August 5.—By the <i>Paraná</i> —Colon	
A. Held	1,500
August 6.—By the <i>Paraná</i> —Balm	
Adolph Hirsch & Co.	100,000
Various	16,500
August 9.—By the <i>Paraná</i> —Colon	
Gontard & Co.	4,000
A. A. Lind & Co.	1,000
Isaac Brandon & Bros.	500
August 9.—By the <i>Paraná</i> —Kingston	
W. R. Grace & Co.	1,000
South American Commercial Co.	800
Knox & Co.	200
August 11.—By the <i>Paraná</i> —Pernambuco	
J. H. Rosbach Bros.	87,000
G. Amsinck & Co.	8,000
August 12.—By the <i>Paraná</i> —Balm	
Adolph Hirsch & Co.	22,500
Laurence Johnson & Co.	15,000
August 13.—By the <i>Paraná</i> —Cartagena	
International Banking Corp.	3,500
Mecke & Co.	1,000
August 13.—By the <i>Paraná</i> —Galveston	
Various	75,000
August 14.—By the <i>Paraná</i> —Colon	
G. Amsinck & Co.	10,000
Gontard & Co.	2,000
R. G. Barthold & Co.	400
Muller, Schall & Co.	400
Piza, Nephews & Co.	3,500

TOTAL EXPORTS FROM MALAYA.

(From January to dates named. Reported by Barlow & Co., Singapore. These figures include the production of the Federated Malay States, but not of Ceylon.)

	Singapore, May 31.	Malacca, June 30.	Penang, June 30.	Port Swettenham, June 30.	Total.
Great Britain	15,010,014	4,329,778	9,765,998	13,897,050	43,002,840
Continental	2,915,527	.....	599,332	20,160	3,535,019
Japan	734,708	.....	.....	.....	734,708
Ceylon	109,199	.....	217,333	754,291	1,080,823
United States	9,816,793	.....	110,000	.....	9,926,793
Australia	214,060	.....	.....	.....	214,060
Total	28,800,301	4,329,778	10,692,663	14,671,501	58,494,243
Same period, 1914.	15,195,659	2,548,819	8,614,533	13,950,414	40,309,425
Same period, 1913.	9,564,859	.....	5,863,467	13,226,350	28,654,676
Same period, 1912.	5,014,131	.....	3,211,759	9,344,140	17,570,030

IMPORTS FROM PARA AT NEW YORK.

[The Figures Indicate Weights in Pounds.]

JULY 26.—By the steamer *Stephen* from Pará and Manáos:

	Fine.	Medium.	Coarse.	Cauchó.	Total.
Meyer & Brown	112,900	20,300	94,700	104,500	332,400
Arnold & Zeiss	62,300	4,900	70,600	127,800	265,600
Henderson & Korn	11,000	43,000	55,800	21,500	131,300
Hagemeyer & Bunn	57,800	.....	1,300	33,400	93,500
H. A. Astlett & Co.	22,400	12,200	11,700	5,000	51,300
Robinson & Co.	44,000	3,300	700	.....	48,000
Muller, Schall & Co.	21,200	.....	7,000	.....	28,200
W. R. Grace & Co.	.....	.....	.....	26,500	26,500
Neuss, Hessel & Co.	23,200	.....	.....	.....	23,200
G. Amsinck & Co.	19,700	.....	.....	.....	19,700
J. T. Johnston & Co.	.....	.....	14,800	2,100	16,900
General Rubber Co.	5,500	.....	.....	.....	5,500
Total	380,000	83,700	257,600	320,000	1,042,100

JULY 30. By the steamer *Rio de Janeiro* from Pará and Manáos:

Meyer & Brown	37,000	.....	29,900	80,800	147,700
Arnold & Zeiss	9,400	1,100	6,300	75,600	92,400
Henderson & Korn	16,000	400	46,400	18,800	81,600
H. A. Astlett & Co.	8,100	3,300	5,400	18,500	37,300
G. Amsinck & Co.	5,700	400	7,300	.....	13,400
Total	76,200	7,200	95,300	193,700	372,400

AUGUST 5.—By the steamer *Merity* from Pará:

Meyer & Brown	15,000	800	14,000	28,000	57,800
Robinson & Co.	31,100	.....	.....	.....	31,100
H. A. Astlett & Co.	700	.....	.....	.....	700
Henderson & Korn	5,000	.....	.....	5,600	10,600
Total	51,800	800	14,000	33,600	100,200

August 16.—By the <i>Castal</i> —Colon:	
G. Amsinck & Co.	5,000
Pablo, Calvet & Co.	4,000
L. S. Schindler & Co.	800
A. M. Capen's Sons	1,800
Mecke & Co.	2,500
American Trading Co.	500
August 16.—By the <i>Paraná</i> —Galveston:	
Various	15,000
August 17.—By the <i>Paraná</i> —Mexico:	
Lawrence Johnson & Co.	10,000
Graham, Hinkley & Co.	1,500
General Export & Commission Co.	200
August 17.—By the <i>Paraná</i> —Port Limón:	
Isaac Brandon & Bros.	3,500
Graham, Hinkley & Co.	1,000
A. Held	100
August 19.—By the <i>Paraná</i> —Galveston:	
Various	200,000
August 23.—By the <i>Paraná</i> —Puerto Cortez:	
A. R. Smith & Sons	5,000
W. R. Grace & Co.	2,000
Manhattan Rubber Manuf.	1,000
Eggers & Hinkley	800
R. G. Barthold & Co.	200
August 23.—By the <i>Paraná</i> —Galveston:	
Various	65,000

AFRICANS.

August 7.—By the <i>Paraná</i> —Liverpool:	
Russell & Greuter Co., Inc.	11,200
Rubber Trading Co.	40,000
Henderson & Korn	45,000
August 7.—By the <i>Paraná</i> —Bordeaux:	
Various	60,000
August 8.—By the <i>Paraná</i> —Liverpool:	
Goodyear Tire & Rubber Co.	60,000
Earle Bros.	10,000
August 9.—By the <i>Paraná</i> —Lisbon:	
S. R. Sequerra & Co.	160,000
August 18.—By the <i>Paraná</i> —Lisbon:	
Robert Babington	135,000
Edward Maurer Co., Inc.	45,000
W. H. Stiles	60,000
S. R. Sequerra & Co.	72,000
Total	312,000

THE RUBBER SCRAP MARKET.

GENERALLY quiet market prevailed during the entire month of August. The absence of large orders would indicate that the rubber mills are stocked. Prices have not varied to any great extent and with few exceptions have been nominal.

The New York imports of rubber scrap for July were 1,612 packages, valued at \$15,989. For the twelve months ending March, 1915, Canada exported to the United States 4,235,610 pounds of rubber waste, valued at \$278,442. Imports for the same period from the United States were 642,885 pounds, valued at \$83,407.

During the month of June, Great Britain imported from the United States 190 bales of rubber scrap, valued at \$30,079.

PRICES PAID BY CONSUMERS FOR CARLOAD LOTS.

New York, August 31, 1915.

	Per Pound.
Boots and shoes	7 3/4 @
White Goodrich and Goodyear tires	7 @
Morgan & Wright and U. S. tires	6 1/4 @ 6 1/2
Trimmed acetics	6 @ 6 1/4
Auto tires, mixed	5 @ 5 1/8
Solid tires	4 1/8 @
No. 1 inner tubes	25 @ 26
No. 2 inner tubes	11 1/4 @ 11 1/2
Red tubes	12 1/2 @
Bicycle tires	3 @ 3 1/8
Irony tires	1 1/4 @ 2 1/4
No. 1 auto peelings	8 @ 8 1/2
Mixed auto peelings	6 3/4 @ 7
No. 1 soft white rubber	11 @ 12
White wringer rubber	9 1/4 @ 9 1/2
No. 1 red scrap	10 @ 10 1/4
Mixed red scrap	7 1/4 @ 7 1/2
Mixed black scrap	2 1/2 @ 2 3/4
Rubber car springs	3 1/4 @
Horse shoe pads	3 @ 3 1/4
Matting and packing	1 1/2 @ 1 3/4
Garden hose	5 1/4 @ 7 1/2
Air brake hose	5 @
Cotton fire hose	1 3/4 @ 2

THE MARKET FOR COTTON AND OTHER FABRICS.

THE placing of cotton on the absolute contraband list by Great Britain during the past month has naturally caused a very uncertain feeling in the cotton trade. The southern planter is in about the same position that he was a year ago with a considerable hold-over stock in the storehouse and the new crop coming rapidly along. The United States government will be asked to help finance the crop and England has signified a willingness to assist in relieving the situation, which is beset with uncertainties for the planter. It is reported that the present stocks at Liverpool are double those held last year at this time.

SEA ISLAND COTTON.

The Sea Island crop for the year 1914-15 was distributed as follows: Georgia, 42,395 bs.; Florida, 33,613 bs.; South Carolina, 5,590 bs.; making a total of 81,598 bs. These are the figures for the grown crop, while the commercial crop is given as 78,857 bs.; which leaves 2,741 bs. held at interior points.

The acreage of the growing crop is reported to be larger than last year; the estimates vary from 20 to 25 per cent. However, the fact that less fertilizer has been used may offset the increase in acreage. In some sections the difference is plainly seen in the growing plant. Generally speaking, the new crop has a good start under favorable conditions that would point to a good average crop. Stocks on hand at Savannah on August 20, 1915, were 1,856 bs., against 2,055 bs. for the same period a year ago. At Charleston there were 170 bs., against 37 bs. Savannah quotations on August 20 were as follows: Extra choice, 23 cents; fancy, 24 cents.

EGYPTIAN COTTON.

In Alexandria, Egypt, the July markets have been weak, due to the general impression that the war will be prolonged with disastrous results to the cotton trade. The spot market has been generally inactive during the entire month and with the exception of a few buyers of Afifi and Uppers very little trading was done. Spot quotations August 17, c. i. f. Boston (shipment

from Alexandria), were as follows: Afifi, \$12.38 to \$18.25; Upper, \$13.00 to \$15.63; Nubari, \$15.50 to \$18.30; Sakelarides, \$17.68 to \$22.88.

FABRICS.

The cotton embargo has not affected the New York fabric market except to stiffen prices. In some quarters it is believed that the present prices are wholly controlled by foreign business and as long as the looms are busy on war supplies there will be a strong market and one that will not be altogether influenced by the scarcity or abundance of raw cotton.

The duck market is strong, with advancing prices. The foreign demand for numbered duck and army duck is increasing. The price of hose and belting duck will doubtless be advanced, for there is already a scarcity of looms necessary to take care of present foreign business.

Tire fabrics for domestic account are active and deliveries show a tendency on the part of the manufacturers to lay in stocks. Foreign business is increasing and it is generally reported that the fabric mills are about sold up.

The situation in rubberized fabrics for the best garment trade is a healthy one and there is a good demand for tweed and covert effects. The market seems to be filled with cheap cotton print goods that do not sell. Evidently the trade is waking up to the fact that cheap rubberized goods are dear at any price.

The following are New York quotations on August 31, 1915:

Imported Woolen Fabrics Specially Prepared for Rubberizing—

Plain and Fancies:

63-inch, 2 3/4 to 3 ounces per sq. yd.	yd.	\$.35 @ \$1.50
36-inch, 2 3/4 to 3 ounces per sq. yd.	yd.	.32 1/2 @ .57 1/2

Plaid Linings:

63-inch, 2 to 4 ounces per sq. yd.	yd.	.32 1/2 @ .50
36-inch, 2 to 4 ounces per sq. yd.	yd.	.20 @ .40

Domestic Worsted Fabrics:

36-inch, 4 1/2 to 8 ounces per sq. yd.	yd.	.20 @ .30
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Aeroplane and Balloon Fabrics:

Wamsutta, S. A. I. L. No. 1, 40-inch	yd.	.22
No. 4, 38 1/2-inch	yd.	.22
O/N B. 36-inch	yd.	.10 3/4

Wool Stockinettes 52-inch:

A—14-ounce	yd.	1.12 1/2
B—14-ounce	yd.	1.25
C—14-ounce	yd.	1.50
D—14-ounce	yd.	.46
E—11 1/2-ounce	yd.	.36
F—14-ounce	yd.	.50
G—8-ounce	yd.	.40
H—11-ounce	yd.	.45
I—9-ounce	yd.	.37 1/2

Colors—white, black, blue, brown.

Tire Fabrics:

17 1/2-oz. Sea Island, combed	sq. yd.	\$.58 @ \$.60
17 1/2-oz. Egyptian, combed	sq. yd.	.45 .47
17 1/2-oz. Egyptian, carded	sq. yd.	.42 @ .44
17 1/2-oz. Peckers, carded	sq. yd.	.35 @ .37

Sheetings:

40-inch 2.50-yd.	yd.	.06 3/4
40-inch 2.70-yd.	yd.	.06 1/2
40-inch 2.85-yd.	yd.	.06 1/4
40-inch 3.15-yd.	yd.	.06 1/4

Osnaburgs:

40-inch 2.25-yd.	yd.	.07 1/4
40-inch 2.48-yd.	yd.	.07
37 1/2-inch 2.42-yd.	yd.	.07

Mechanical Ducks:

Hose	lb.	.21
Belting	lb.	.20

Carriage Cloth Duck:

38-inch 2.00-yd. enameling duck	yd.	.11
38-inch 1.74-yd.	yd.	.12
72-inch 6.66-yd.	yd.	.25 1/2
72-inch 7.21-yd.	yd.	.26 1/2

Drills:

38-inch 2.00-yd.	yd.	.10 3/4
40-inch 2.47-yd.	yd.	.08 3/4
52-inch 1.90-yd.	yd.	.11 1/4
52-inch 1.95-yd.	yd.	.11
60-inch 1.52-yd.	yd.	.14

Yarns:

Garden Hose 12, 2 cabled	lb.	.21
Fire Hose 12/1	lb.	.17 @ .19

Burlaps:

22 7 1/2-oz.	100 yd.	\$ 5.70
40 7 1/2-oz.	yd.	6.00
40—8-oz.	yd.	6.10
40—10-oz.	yd.	7.65
40—10 1/2-oz.	yd.	7.75
45—7 1/2-oz.	yd.	7.10
45—8-oz.	yd.	7.20
48—10-oz.	yd.	10.25

THE MARKET FOR CHEMICALS AND COMPOUNDING INGREDIENTS.

THE month of August was a particularly quiet one in the rubber chemical trade, and prices, with a few exceptions, have remained the same as a month ago.

The fillers have been in normal demand at prices that have shown little change during the month. Barytes, both pure white and off color, have declined about \$2 a ton. The producers of whiting are still having difficulty in securing chalk supplies, yet prices have not changed. Asbestos, talc and magnesia carbonate are nominal.

The pigments have been quoted freely. Domestic lithopone has had a good demand, at prices slightly under last month, and zinc sulphide remains firm. There has been little or no change in zinc oxide during the month. Crimson antimony is difficult to obtain; in fact there is so little in the market that quotations are withheld.

About the middle of the month pig lead eased off in price and later, red oxide, sublimed blue lead, and white lead basic sulphate all declined about one cent a pound. Domestic litharge also shows a small decline, and there is little foreign litharge offered. Hydrated lime has declined a cent a pound and calcined magnesia is nominal.

Dry colors have been quiet, with the exception of Prussian blue, which has been selling far above the normal figures. Soluble aniline colors are quoted from day to day at \$2 a 2.50 a pound, the normal price being from 75 cents to \$1.

Acetic acid has also advanced, glacial selling for 15 cents. Acetone has advanced to 28 a 29 cents, and toluol is selling for \$5 per gallon, due to the active foreign demand that includes benzol. Carbon tetrachloride in drums has declined to 15 cents.

Late in August the naphthas advanced one and two cents a gallon, following the advance in crude petroleum.

PRICES OF CHEMICALS AND COMPOUNDING INGREDIENTS. NEW YORK, AUGUST 31, 1915.

Acetic acid (drums).....	lb.	80.75	a 80.25
Acetic acid, 28 per cent. bbls.....	2.75	a 2.90	
Alcali (carbonate).....	115	a	
Aluminum flake (casks).....	18.00	a 20.00	
Ammonium carbonate.....	Nine		
Antimony, crimson, sulphuret.....	Nine		
Asbestos.....	19.00	a 20.00	
Asbestos.....	.04	a .05	
Asphaltum "G" Brilliant.....	.03	a	
Barium sulphate, precipitated.....	70.00	a 90.00	
Barytes, pure white.....	16.00	a 22.50	
Barytes, off color.....	12.50	a 14.00	
Benzol, pure.....	90.00	a	
Benzol, pure.....	8.00	a 1.00	
Beta Naphthol.....	2.10	a 2.50	
Black Hyper.....	.25	a	
Black Peroxide.....	.03	a .03 1/2	
Bole ash.....	.06	a	
Bole ash, black.....	.06	a	
Cadmium tri-sulphate.....	Nine		
Yellow.....	Nine		
Castella gum.....	30	a .75	
Carbon, bisulphide (drums).....	.06 1/2	a .07 1/2	
Carbon, black (cases, Boston).....	.07	a	
tetrachloride (drums).....	.15	a	
Caustic soda, 76 per cent. bbls.....	2.50	a 2.50	
Chalk, precipitated, extra light.....	.04	a .04 1/2	
China clay, domestic.....	30.00	a 6.00	
China clay, imported.....	30.00	a 24.00	
Chrome, green.....	.08	a .10	
Yellow.....	.13	a .14 1/2	
Cotton linters.....	.05	a	
Dichlorethane (drums).....	1.0	a .12 1/2	
Emery.....	70.00	a	
Gas black.....	.05 1/2	a .06	
Gilsonite.....	37.50	a 42.50	
Glycerine, C. P. (drums).....	.25	a	
Graphite, flake (250 to 400 pound bbl.).....	.14	a	
powdered (250 to 400 pound bbl.).....	.05	a	
Green oxide of chromium (casks).....	.30	a .35	
Ground glass.....	.03	a	
Iron oxide, red, reduced grades.....	.02	a .05	
red, pure.....	.05	a .08 1/2	
Infusorial earth, powdered.....	50.00	a	
bolts.....	60.00	a	
Ivory, black.....	.08	a .12	
Indian red.....	.02 1/2	a .05 1/2	
Lampblack.....	.14	a .08	

Lead, red oxide.....	66 1/2	a 66 1/2
white, reduced.....	95	a 100
white, basic.....	.06 1/2	a
white, basic sulphate.....	.05	a 6 1/2
Lime, heavy.....	.01	a .01 1/2
hydrated.....	.06	a .06 1/2
Litharge.....	.10	a .11
Litharge, domestic.....	.07 1/2	a .08
hydrated.....	.07	a
Magnesia carbonate.....	.04 1/2	a
domestic.....	.06 1/2	a .07 1/2
foreign.....	.07	a
Magnesia, calcined, powdered.....	36.00	a
powdered.....	.03	a .07
Mineral oil.....	.01 1/2	a .02 1/2
Naphtha, heavy grade.....	.11	a
light.....	.10	a
68-70°.....	.11	a
Oil, rubber.....	1.70	a
crude.....	.06 1/2	a .07 1/2
hydrocarbon.....	.50	a
anthracene, B. T. 1.....	.25	a
anthracene, B. T. 2.....	.25	a
anthracene, B. T. 3.....	.25	a
anthracene, B. T. 4.....	.25	a
anthracene, B. T. 5.....	.25	a
anthracene, B. T. 6.....	.25	a
anthracene, B. T. 7.....	.25	a
anthracene, B. T. 8.....	.25	a
anthracene, B. T. 9.....	.25	a
anthracene, B. T. 10.....	.25	a
anthracene, B. T. 11.....	.25	a
anthracene, B. T. 12.....	.25	a
anthracene, B. T. 13.....	.25	a
anthracene, B. T. 14.....	.25	a
anthracene, B. T. 15.....	.25	a
anthracene, B. T. 16.....	.25	a
anthracene, B. T. 17.....	.25	a
anthracene, B. T. 18.....	.25	a
anthracene, B. T. 19.....	.25	a
anthracene, B. T. 20.....	.25	a
anthracene, B. T. 21.....	.25	a
anthracene, B. T. 22.....	.25	a
anthracene, B. T. 23.....	.25	a
anthracene, B. T. 24.....	.25	a
anthracene, B. T. 25.....	.25	a
anthracene, B. T. 26.....	.25	a
anthracene, B. T. 27.....	.25	a
anthracene, B. T. 28.....	.25	a
anthracene, B. T. 29.....	.25	a
anthracene, B. T. 30.....	.25	a
anthracene, B. T. 31.....	.25	a
anthracene, B. T. 32.....	.25	a
anthracene, B. T. 33.....	.25	a
anthracene, B. T. 34.....	.25	a
anthracene, B. T. 35.....	.25	a
anthracene, B. T. 36.....	.25	a
anthracene, B. T. 37.....	.25	a
anthracene, B. T. 38.....	.25	a
anthracene, B. T. 39.....	.25	a
anthracene, B. T. 40.....	.25	a
anthracene, B. T. 41.....	.25	a
anthracene, B. T. 42.....	.25	a
anthracene, B. T. 43.....	.25	a
anthracene, B. T. 44.....	.25	a
anthracene, B. T. 45.....	.25	a
anthracene, B. T. 46.....	.25	a
anthracene, B. T. 47.....	.25	a
anthracene, B. T. 48.....	.25	a
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London prices, August 6, 1915, were as follows: Benzol, per gal., 90 per cent., 15; 70-75 per cent., 14; 60-70 per cent., 13; 50-60 per cent., 12; 40-50 per cent., 11; 30-40 per cent., 10; 20-30 per cent., 9; 10-20 per cent., 8; 0-10 per cent., 7.

COTTON LINTERS USED IN RUBBER COMPOUNDING

Cotton linters is the trade name of soiled short fiber waste product from ginning cotton. Heretofore it has been utilized chiefly as mattress topping and in the upholstery trade generally. Recently it has been found that it affords a cheap fiber adapted to rubber compounding for special purposes. The price runs as low as 3 1/2 cents per pound in large lots, but varies with the amount and market conditions. Today the price is 5 cents per pound in bales of about 400 pounds.



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SEPTEMBER 1, 1915

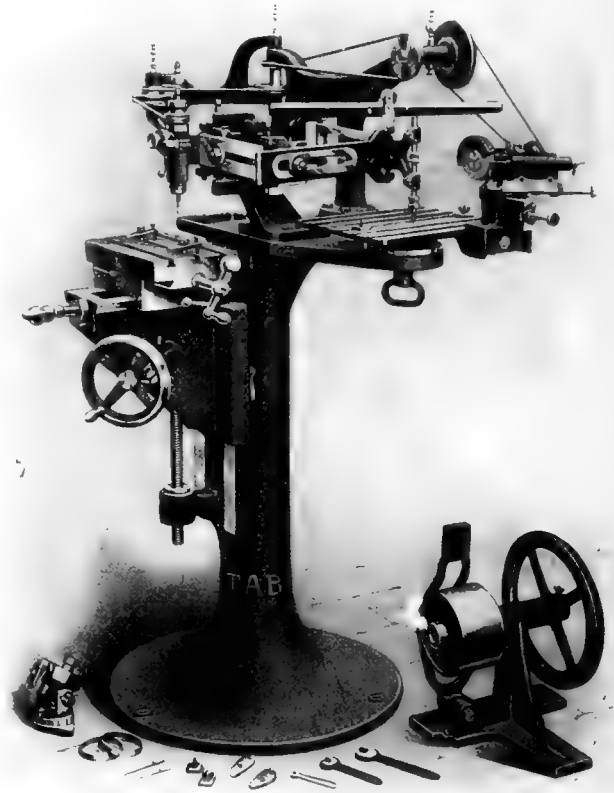
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HARD RUBBER ENGRAVING MACHINE.

ILLUSTRATED herewith is a machine that engraves plain and ornamental letters, designs, trade marks, etc., on hard rubber articles, by means of a pantograph link motion. It will copy any size from 0.039 inch up to $4\frac{3}{4}$ inches in the proportion of 1 to 1 down to 10 to 1. Thus a surface of $4\frac{3}{4}$ inches square can be covered with the pantograph alone. By means of the transverse and longitudinal slide motion of the table, both of which have graduated dials to facilitate the setting of the work, the total area is increased to approximately 10 x 12 inches. The chief limi-



tation of these machines has been a gradual loss of accuracy due to wear on the spindle bearings. In the S & S machine, however, the wear is reduced to an absolute minimum. This is accomplished by taking up the side pull, due to the small driving belt, on a stationary sleeve. The power is transmitted to a small spring collar which is clamped to the end of the spindle by two small pins. This means that the machine will retain its high degree of accuracy almost indefinitely.

The other good points are the strong, rigid construction and the micrometer adjustment of the cutter which can be instantly raised from the work by a lever. The machine is manufactured by Schuchardt & Schütte, 90 West street, New York.

A PNEUMATIC JACK LIFT.

A new jack lift operated by compressed air has recently been placed on the market. The air may be supplied either from an ordinary hand air pump or from the mechanical air pumps which are now part of the equipment of a great number of motor cars. This jack is sold with 3 feet of rubber air hose and it will be appreciated by motorists who know the difficulties of operating with the ordinary lift jack under the rear axle of a machine. Supplied with air from an ordinary hand pump this jack is capable of lifting a six-ton truck. [National Motor Supply Co., Cleveland, Ohio.]

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